**INTEGRATED LOGISTICS SUPPORT PLAN
FOR THE**

**INTEGRATED TERMINAL WEATHER SYSTEM
(ITWS)**

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

March 27, 1995

Coordination Page

The Integrated Terminal Weather System (ITWS) Integrated Logistics Support Plan (ILSP) documents the approach for life cycle support of the system. The ILSP describes the support requirements for the system and will identify the resources needed to satisfy those requirements. The ILSP addresses initial support for the ITWS and the possible transition to FAA in house support. The ILSP will be updated as the Maintenance Requirements Document is finalized and the program progresses. The ILSP will be maintained as the central logistics plan for the program.

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Chapter 1. Introduction

1.1 Integrated Logistics Support Plan

This Integrated Logistic Support Plan (ILSP) for the Integrated Terminal Weather System (ITWS) provides guidance for National Airspace Integrated Logistics Support (NAILS) planning and execution.

1.1.1 Purpose

The purpose of this ILSP is to set forth the Federal Aviation Administration's (FAA) plan for providing logistics support for the ITWS. This ILSP summarizes the actions that will be taken by FAA organizations that are responsible for providing various elements of support. It also outlines the contractor's role in the support program. The ILSP is the single approved source for information concerning logistics support for the ITWS, and as such is the authoritative reference for the Program Manager (PM) and other senior FAA managers, as well as for the NAILS program participants. This ILSP includes responsibilities, management matrix, maintenance requirements, and descriptions of the NAILS elements as well as appendices of applicable reference and supporting documents.

1.1.2 ILSP Revision Requirements

The ITWS ILSP is both a critical planning and a living document, and will be continually updated throughout the life cycle of the ITWS program. Whenever there is a change in the supportability requirements or program contractual agreements, or at each Key Decision Point (KDP), this document will be revised appropriately to reflect the current state-of-the-program.

1.1.3 Acquisition Strategy and Program Phase

The ITWS Program - Capital Investment Plan (CIP) No. 63-21 - is a part of the Aviation Weather Development Program (AWDP) and is a Level 1 acquisition. The Concept Exploration and the Demonstration and Validation Phases have been compressed to recognize and take full advantage of existing studies and past efforts. Following KDP-3, a single contractor and concept will be selected to develop and install a turnkey integrated communication network system of hardware and software. The acquisition strategy is to use a single contract for full scale development and limited production with options for full production. It will include software development, system production, and maintenance during fielding. The Request For Proposal (RFP) will reflect the Government's intent to identify the requirements for procurement options with not-to-exceed price ceilings. The Government will reserve the right to select procurement options.

The Government's decision to make negotiated contract awards to the KDP-3/Full Scale Development (FSD) contractor, will be contingent on that contractor's ability to deliver full scale "First Article Systems" that meet performance requirements within schedule constraints. During the final negotiations for procurement price, the Government will make maximum use of published commercial price lists permitting allowance for technical difficulties encountered during FSD. However, the contract will not exceed the price ceiling.

The ITWS program is currently in the Demonstration and Validation Phase having passed KDP-2 in November 1992.   This ILSP is required to support entry approval for the ITWS program into the Full Scale development Phase following KDP-3.

1.2 System Description

ITWS is a developmental program initiated by the FAA to produce a fully-automated, integrated terminal weather information system to improve the safety, efficiency and capacity of terminal area aviation operations. It will automatically collect and integrate all the weather data available in the terminal area, from both ground-based and airborne sensors, and resolve errors and discrepancies in the various sensor data so that users of the data receive the same, consistent, and reliable terminal weather data.

Refer to Figures (1), (2) , and (3) for conceptual representations of how ITWS may appear. Figure (1) is an overall block diagram of the system architecture. Figures (2) and (3) render pictorial views of the ITWS single and multiple airport configuration concept.

ITWS Architecture
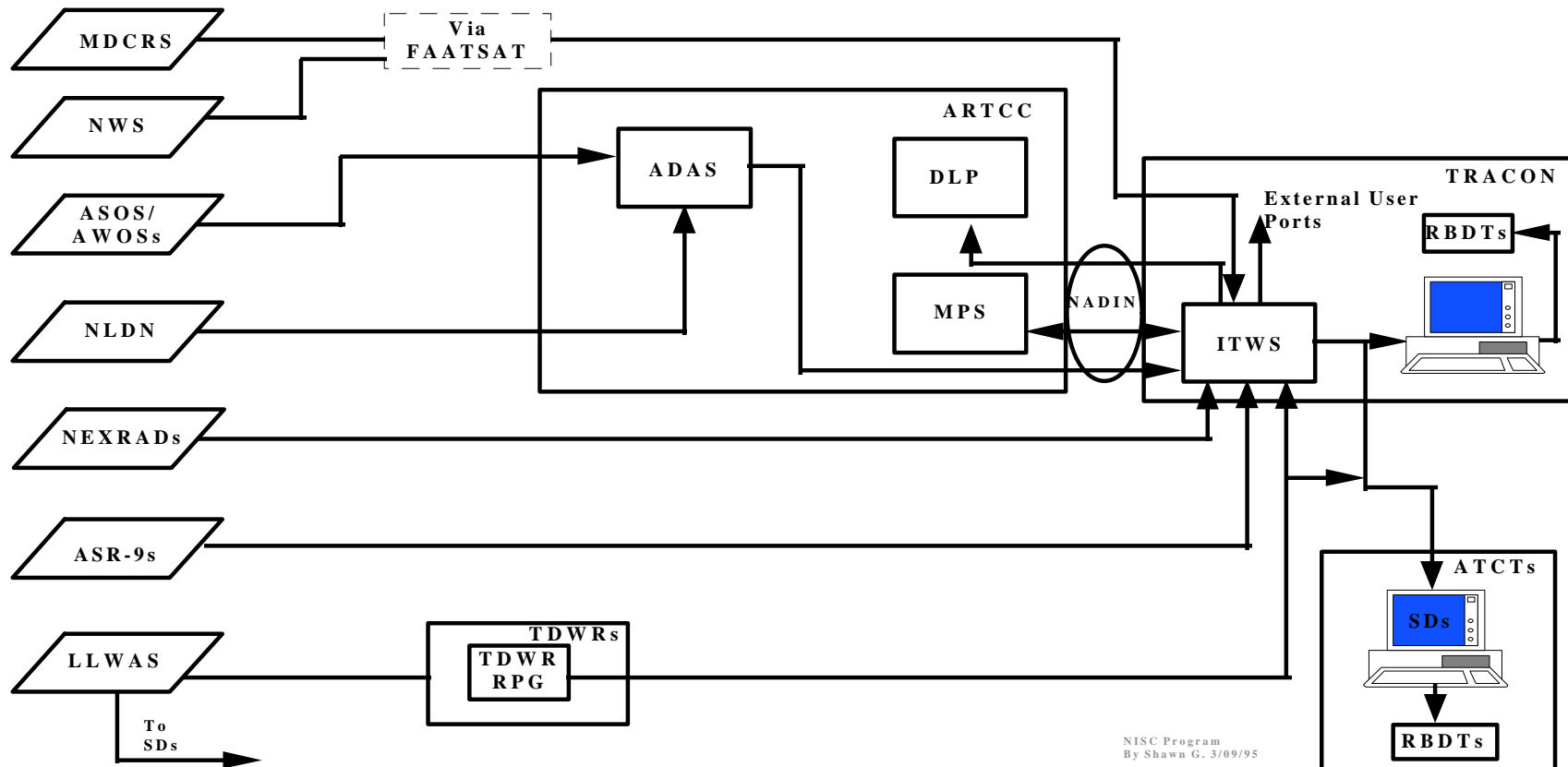
Figure 1: ITWS Architecture

(Note: Refer to Appendix B1 for acronym definitions.)

SINGLE AIRPORT FACILITY
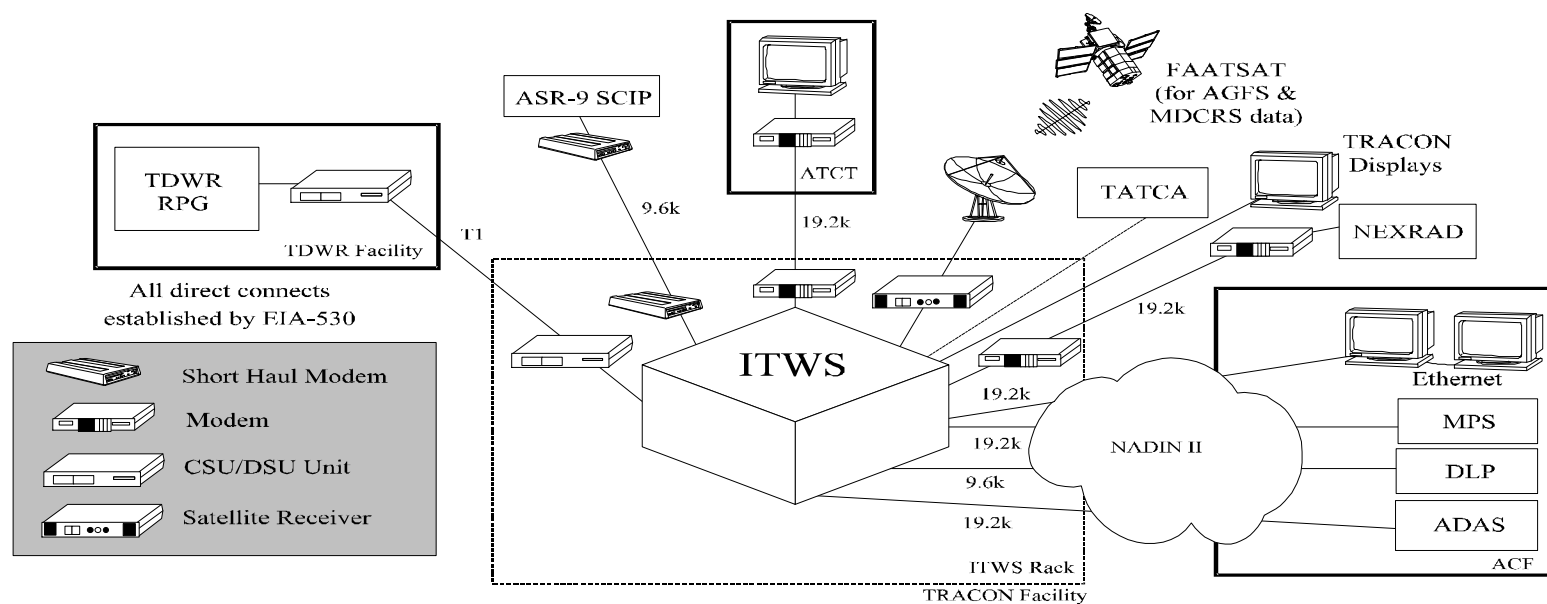
Figure 2: Single Airport Facility

(Note: Refer to Appendix B1 for acronym definitions.)

MULTIPLE AIRPORT FACILITY
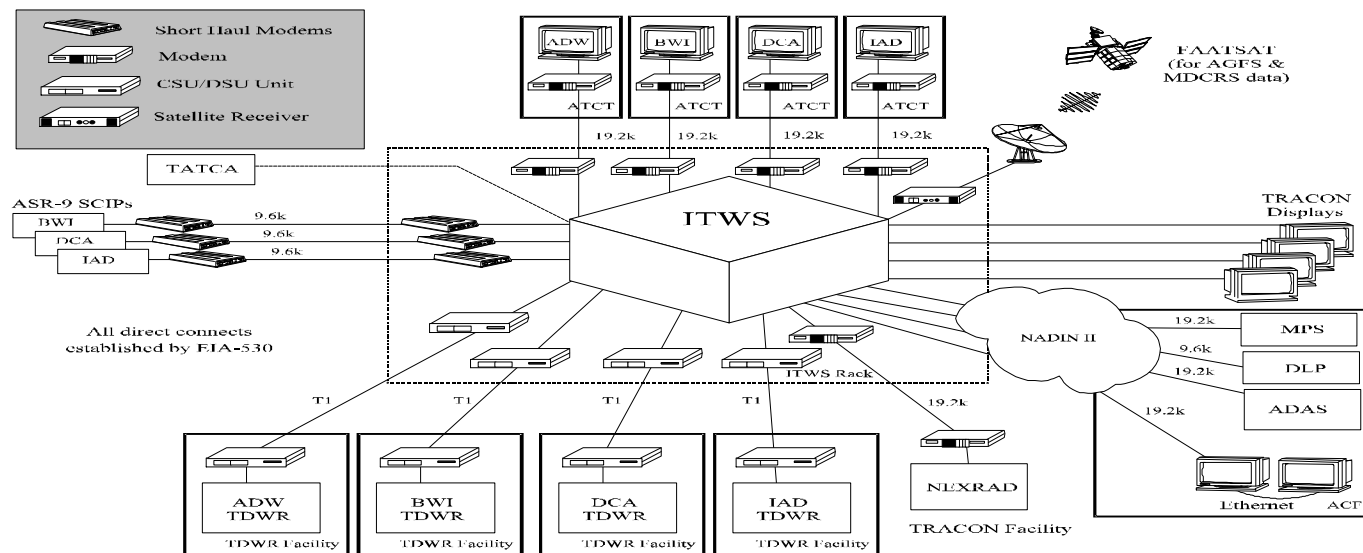
Figure 3: Multiple Airport Facility

(Note: Refer to Appendix B1 for acronym definitions.)

The ITWS will acquire data from FAA and National Weather Service (NWS) sensors, as well as from aircraft in flight in the terminal area. Refer to the table below.

Table 1: Weather Data Sources

> FAA/NWS Next Generation Weather Radar (NEXRAD) -WSR-88D
> Meteorological Data Collection and Reporting System (MDCRS)
> Automated Surface Observation System (ASOS)
> Automated Weather Observation System (AWOS)
> Airport Surveillance Radar - Nine (ASR-9)
> Terminal Doppler Weather Radar (TDWR)
> Low Level Windshear Alert System (LLWAS)
> National Lightening Detection Network (NLDN)
> Aviation Gridded Forecast System (AGFS)

The ITWS will provide near-term (0-30 minute) automated, frequently updated (every five minutes) weather information about the terminal weather situation in easily understood graphical, and where appropriate, text form, requiring no further meteorological interpretation by the user. The following table, lists the generated weather products output planned for Initial Operating Capability (IOC) systems.

Table 2: Weather Products Output

> Wind Shear
> Gust From Windshift Estimate
> Precipitation
> Storm Motion & Extrapolated Position
> Storm Cell Information
> ASR-9 Anomalous Propagation (AP)
> Tornado Detection and Alert
> Airport Lightning Warning
> LLWAS Winds
> Terminal Winds
> Runway Configuration

1.2.1 Hardware

Present recommendation is to allocate ITWS functions to an independent Terminal Radar Approach Control Facility (TRACON) as a stand-alone system. ITWS will be predominately Commercial Off-the-Shelf (COTS) equipment and will replace the TDWR Situation Display Units (SDU). The TDWR ribbon displays will be retained. COTS hardware shall be consistent for all deployed systems, i.e., same manufacturer, type, and version. The ITWS program will fund for interfaces which need to be implemented in

other National Airspace System (NAS) systems to accommodate the ITWS. Wherever feasible, modems employed in the ITWS design shall be of the type supported by the FAA. The hardware requirements to date have not been fully identified and this section will be updated as information is made available.

Refer to Figure (4) for a conceptual representation of how an ITWS rack elevation may appear. ITWS for the smaller single airport facility installations are expected to use the same computer as the multiple airport facility configurations, except that they will contain fewer Line Replacable Units (LRU), interface devices, etc.

MULTIPLE AIRPORT FACILITY
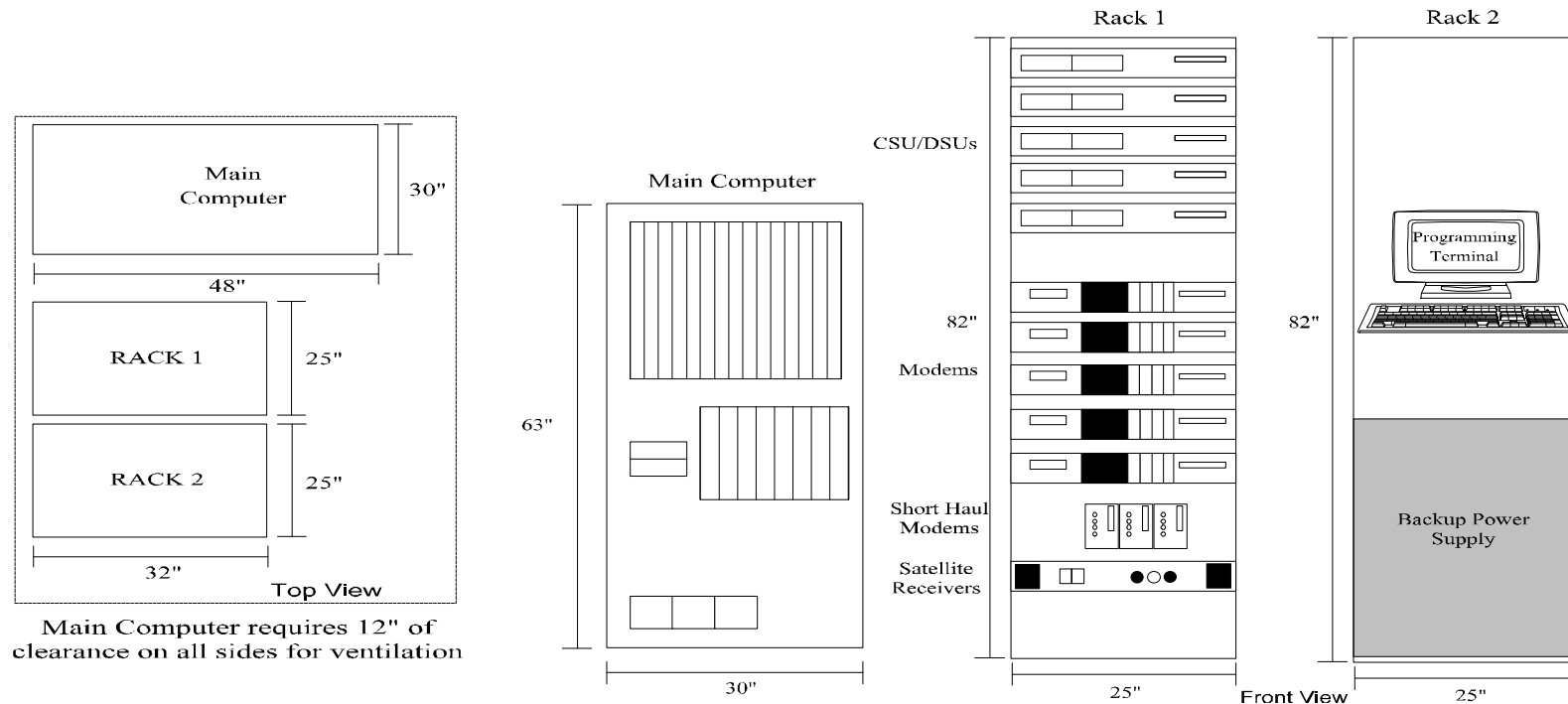
Figure 4: (Concept) Rack Elevation (Multiple Airport Facility)

1.2.2 Software

The major thrust of the ITWS Program will be software development. Because of a substantial investment required in research and development (R&D), the expertise to develop the required algorithms using rapid prototype techniques generally reside only in Government supported laboratories. On the basis of similar design previously provided to the FAA, the product development portion of the contract was awarded to Massachusetts Institution of Technology/Lincoln Laboratory (MIT/LL). The selection of ITWS processing equipment and integration of Government Furnished Equipment (GFE) algorithms into this equipment will be competitive.

During Demonstration-Validation (DEMVAL), software was developed in a rapid prototype environment to support the algorithm validation requirements. Development, integration, and testing of algorithms for the ITWS was accomplished by Lincoln Labs who had the required experience in meteorological science, aviation application, rapid prototype techniques, and knowledge of the FAA environment. The goal for the final software products is that they should be portable between one operating system and another without modification, except possibly for minor recompilation. All software application products developed for the ITWS system will be Government owned.

The Government will supply engineering specifications and DEMVAL prototype software as Government Furnished Information (GFI). The GFI software will consist of examples of implementation of the product generation algorithms, and will not be mandatory for contractor use in developing the production software. After developing the production software, the contractor shall host it in a suitable platform and environment.

Operational Support Service (office code - AOS) will provide support for software. Regardless of whether or not contractor support is used, AOS will remain active in the configuration control process and provide assistance to the field.

1.2.3 Replaced Equipment

The ITWS program is not intended to replace any existing NAS equipment.

1.2.4 Planned System Life

One of the tasks to be undertaken by the ITWS program is to integrate existing aviation weather systems used by the aviation community. The ITWS is a 20 year life-cycle program that will pass through two phases. Phase One - IOC; will integrate data from various weather systems that are provided to the user with capabilities being developed in the support of the end-state configuration. Phase Two - P^3I (Pre-Planned Product Improvement); will introduce product improvements/upgrades designed and/or selected and integrated into the system to extend the ITWS's capabilities over time. An operational test bed has been used to test and validate algorithms to be implemented at

KDP-3. Because COTS is being selected for the ITWS hardware, program planning will include hardware replacements every five to seven years for the 20 year life cycle.

1.3 Systems Operation Concept

The ITWS will provide for more efficient planning of aircraft movements in the terminal/TRACON area by significantly improving the quality and timeliness of near-term predictions of weather impacting the local area. The identification of weather impacts specific to approach and departure corridors, corner posts, runways and airport surface will enable more efficient coordination of routing strategies. Aviators, dispatchers, and traffic managers, controllers and airport operations and managers will be able to anticipate rather than just react to these weather impacts and will be able to coordinate the movement of traffic through alternate arrival/departure routes resulting in overall increases in capacity. The ability to anticipate impacts such as the cessation of significant weather in the area, and select optimal routes or holding strategies prior to arrival in the area, will result in savings of time and fuel.

The ITWS Program intends to deploy a total of 37 systems as follows:

> 34 systems in TRACONs at Single (SAF) and Multiple (MAF) Airport Facilities
> 1 system at the Program Support Facility (PSF) located at AMC
> 1 system at the FAA Academy
> 1 system at the FAA Technical Center

These sites are listed individually in Appendix C.

The 34 deployed field site systems are intended to address the terminal needs of all the 45 Terminal Doppler Weather Radar (TDWR) equipped airports. Two ITWS configurations are currently planned. In one configuration the ITWS processor will be installed in TRACON equipment rooms. TDWR monitors in the TRACON and the air traffic control towers (ATCT) will be used to display the ITWS data. A second configuration is planned for multiple airport facilities (MAF) - a consolidated TRACON facility that covers two or more airports. In this configuration the ITWS processor is located in the MAF equipment room.

1.4 Studies and Analyses

Acquisition of COTS equipment for the ITWS program requires that some analyses be completed on logistics support alternatives. To arrive at a decision relative to organic verses contractor depot support, the following studies and analyses are planned:
- Life Cycle Cost (LCC)
- Level of Repair Analysis (LORA)

Chapter 2. Logistics Management

This Logistics Management section describes the organizational structures and responsibilities of project management for both Government and contractor as they pertain to logistics planning and support.

2.1 NAILS Program Objectives and Logistics Support Elements

NAILS is an interrelated, unified, and iterative approach to the managerial and technical activities that supports the National Airspace System (NAS). To focus management's attention on key support issues, NAILS identifies eight logistics support elements listed in the table below.

Table 3: Logistics Support Elements

> Maintenance Planning
> Supply Support
> Support Equipment
> Training, Training Support, and Personnel Skills
> Direct-Work Maintenance Staffing
> Maintenance Support Facilities
> Packaging, Handling, Storage, and Transportation
> Technical Data

2.2 NAILS Program Organizational Structure

The NAILS Program Organization is a matrix-type organization composed of both Government and contractor representatives, working together towards the common goal of ensuring that all supportability requirements are identified and acquired in the most cost-effective manner available. At the heart of this organization is the NAILS Management Team.

2.2.1 Government NAILS Management Team (NAILSMT)

The program's Associate Program Manager for Logistics (APML), along with the Program Management Office (PMO), has established the NAILSMT in order to ensure coordinating logistics support efforts within the FAA. The NAILSMT supports these two offices in planning, coordinating, and directing the execution of logistics support for the program. The goal of the NAILSMT is to ensure that adequate and timely support is provided to the system(s). The following table depicts the ITWS NAILSMT membership.

Table 4: NAILSMT POINTS-OF-CONTACT

NAME	OFFICE CODE	TELEPHONE	FAX
Program Manager			
Ken Klasinski	ARD-80	202-281-7081	202-287-7034
Associate Program Manager Logistics			
Ralph Taylor	ALM-400	202-267-3163	202-267-5613
Richmond Miller	ALM-400/NISC	202-651-3128	202-651-3140/3141
Robert Hanlon	ALM-400/NISC	202-651-3218	202-651-3140/3141
FAALC NAILS Planning			
Ed Andrews	AML-200	405-954-7491	
Diana Jones	AML-200	405-954-4411	
Joanna York	AML-130	405-954-8582	
Maintenance Planning			
Ken Thompson	ALM-400	202-267-9734	
Amos S. Wamble Jr.	AML-462	405-954-5235	
Jacquita Parker	AML-443	405-954-7411	
Supply Support			
John M. Dunlap	AML-652	405-954-5635	
Robert Van Hoozer	AML-632	405-954-8273	
Training			
Dave Brown	AMA-441	405-954-3426	
Rich Acosta	ATZ-110	202-366-1296	202-366-7620
Gary Long	AFZ-100	202-493-4067	
Al Miller	AFZ-100/NISC	202-651-3151	202-651-3140/3141
Cathy Perkins	AFZ-100/NISC	202-651-3056	202-651-3140/3141
Support Equipment			
Dennis Behrens	AML-642	405-954-9376	
Kyle P. Sivard	AML-464	405-954-4414	
Second Level Engineering Support			
George McLean	AOS-115	202-267-8437	202-267-5207
Jim Sanzone	AOS-230	405-954-5149	
Dennis Roofe	AOS-251	405-954-4992	
Bettie Loudenslager	AOS-252	405-954-5186	
Marcella Meador	AOS-255	405-954-5168	
Logistics Support Analysis			
Don Horton	AML-100	405-954-3368	

Packaging, Handling, Storage, and Transportation
  Jim D. Lenning   AML-340   405-954-5487

Deployment Readiness Review Coordinator
  Brian Robinson   AAF-1   202-651-3147   202-651-3140/3141

Maintenance Staffing
  Barbara Froome   AFZ-200   202-267-3203
   Vic Poillucci   AFZ-200/NISC   202-651-3049   202-651-3140/3141

Technical Data
  Amos S. Wamble Jr.   AML-462   405-954-5235
  Jim Sanzone   AOS-250   405-954-5149
  Bettie Loudenslager   AOS-250   405-954-5186

Facilities Management
  Mel Haworth   AMP-1A/NISC   405-954-8604

Regional Associate Program Managers
  Alers, Orlando   AGL-421.9   Great Lakes   708-294-7584
  Carter, Walter   ASO-420A   Southern   404-305-6299
  Curran, Darby   ANM-422   Northwest Mountain   206-227-2434
  Davis, Ed   ANE-422D   New England   617-238-7435
  Malek, Nayla   AEA-421.1   Eastern   718-553-1176
  Kolp, Bill   ASW-421.1   Southwest   817-222-4212
  Riffel, Lee   ACE-425R   Central   816-426-5676
  Shea, John   AWP-422.42   Western Pacific   310-297-1079

Other Key Program Personnel
  Billy Reed   ATR-337   APM Requirements   202-267-3685   202-267-5965
  Harry LeBlanc   ASU-340   APM Contracting   202-606-4525   202-606-4269
  Christian Jordan   AGC-530   APM General Counsel   202-267-3408
  Mike Porter   ASE-100   APM Systems Eng.   202-287-8619   202-287-8756
  Bill Benner   ACW-200D   APM Testing   609-485-4032   609-484-8412
  Bill Kiser   ANS-200/NISC   APM Nas Integration   202-651-3220   202-651-3140
  (TBD)   APM Quality
  (TBD)   APM Procedures
  (TBD)   APM Eng. & Imp.

2.2.2 NAILSMT Roles and Responsibilities

Specific responsibilities for other supporting FAA organizations are contained in FAA Order 1100.2C, <u>Organization-FAA Headquarters</u>; and FAA Order 1100.5C, FAA <u>Organization-Field</u>.

<u>Program Manager (AND-460)</u>. The Program Manager is responsible for the overall management and direction of the program, including the funding, acquisition, design, development, testing, and commissioning of the system.

<u>Associate Program Manager for Logistics (ALM-400)</u>. The APML is responsible for ensuring that all applicable NAILS element requirements are planned, acquired, managed, and integrated into all new NAS subsystems, equipment and facilities in a manner that provides for total life-cycle support.

<u>Maintenance Requirements (ALM-400)</u>. ALM-400 determines requirements for site-level maintenance, site-level spares, sector and regional office staffing, portable test equipment, and site-level maintenance facilities; coordinates with AFZ-100 regarding Airway Facility training requirements; coordinates with FAALC regarding depot-level maintenance and integrated logistics support for test equipment; and determines certification requirements for equipment items.

<u>Air Traffic Plans and Requirements (ATR-100/200/300)</u>. ATR is responsible for identifying Air Traffic (AT) requirements and ensuring that development includes those requirements.

<u>Airway Facilities Training Division (AFZ-100)</u>. AFZ is responsible for establishing and implementing training requirements to support CIP program maintenance. This includes the identification and validation of training requirements through review of system documentation and field input, development and construction of training sections within acquisition and NAILS documentation, establishment of training implementation strategy, development and management of course quota and participation in the review and approval of training deliverables.

<u>Air Traffic Training Division (ATZ-100)</u>. ATZ-100 is responsible for analyzing Air Traffic (AT) training requirements and coordinating with the FAA Academy to schedule AT training to meet program requirements.

<u>National Engineering Field Support Division (AOS-200)</u>. The National Engineering Field Support Division is the principal element of the service assigned responsibilities encompassing direct engineering support to field facilities; directive publication and issuance; in-service improvement and modification development, evaluation, and implementation for NAS systems.

FAA Logistics Center (AML). FAALC determines requirements for depot-level maintenance, depot maintenance support facilities, supply support (except site spares), FAALC staffing, automatic test equipment, test program sets, other depot-level support equipment, portable test equipment for FAALC, and depot-level training; provides exchange and repair (E&R) service and repair and return (R&R) service for failed site-level spares and test equipment; provides depot-level maintenance support for portable test equipment; and defines requirements for and manages depot-level contract maintenance.

FAA Academy (AMA-400/500). AMA-400, Airway Facilities Division, and AMA-500, Air Traffic Division, determine requirements for FAA Academy staffing, training equipment and training support equipment, and plans and schedules training to meet program requirements.

Contracting Division (ASU-300). ASU-300 is responsible for converting program requirements to contracting documents and for providing contracting officer support.

FAA Technical Center. The FAATC determines requirements for testing and evaluation, and conducts integration testing on new systems.

FAA Regions. Responsible for supervision and assignment of Airway Facilities (AF) work force. Each region is responsible for ensuring that AF sectors within the region perform adequate maintenance of the system, or to oversee contractor maintenance.

2.2.3 Contractor Organizational Structure and Responsibilities

The contractor shall be responsible for executing a fully integrated effort that ensures management and technical competency of the NAILS program. The contractor's logistics manager will interface with the FAA APML. The logistics manager coordinates all contractor logistics functions, provides the day-to-day NAILS management directions, and has the overall responsibility for the contractor's NAILS Program.

2.3 Meetings and Conferences

Various meetings and conferences are required in order to properly gather and disseminate critical program information to and from all program participants in a timely and effective manner. Primary program related meetings include, but are not limited to the following:

- Program Management Team Meetings
- NAILS Management Team (NAILSMT) Meetings
- Government-Contractor Meetings
- Logistics Support Analysis (LSA) Guidance Conference and Data Reviews
- Provisioning Conferences and Data Reviews
- Technical Interchange Meetings

- Technical Instruction Book In-process Reviews

2.3.1 Program Management Team Meetings

Program Management Team Meetings are those meetings scheduled at regular intervals, for the express purpose of keeping the Program Manager (PM) appraised of program status. These meetings allow for early identification of problem areas and help to ensure against unexpected schedule slips.

2.3.2 NAILSMT Meetings

NAILSMT meetings will be held at least annually, and at the discretion of the chairperson (the APML). During the first year after production contract award, NAILSMT meetings are expected to be held semi-annually at minimum. Further guidance on responsibilities of the NAILSMT is addressed in (FAA) Order 1800.58A, NAILS Policy.

2.3.3 Government-Contractor Meetings

The APML is responsible for monitoring and tracking the contractor's performance in all NAILS element requirements. The APML, assisted by the NAILS element managers, will meet periodically with the contractor to discuss NAILS related issues.

2.3.4 LSA Guidance Conferences and Data Reviews

The purpose of the LSA Guidance Conferences and Data Reviews is to ensure proper dissemination of supportability requirements and to support the analysis effort by amplifying baseline data provided in the System Level Specification (SLS). This guidance consists of maintainability and logistics requirements, goals, and concepts imposed as part of the contract. The information gathered provides parameters needed to guide design influence and tradeoff decisions, because when necessary, an Engineering Change Proposal (ECP) or Notice Change Proposal (NCP) in source data could cause a change in one or more of the LSA records. Therefore, as a vital part of the process, the FAA conducts rigorous data reviews of LSA documentation as it is produced.

2.3.5 Provisioning Conference and Data Reviews

Provisioning data reviews may be held to ensure that sufficient provisioning data is available, when necessary, for both COTS and non-COTS equipment. The provisioning data is normally submitted by the contractor in three increments. The DD Form 1949-3 data elements required for provisioning will be defined at a later date. A provisioning conference will be held after receipt and preliminary acceptance of the data that comprises the Provisioning Parts List (PPL). At the provisioning conference the contractor shall provide a complete ITWS system, technical documentation, technicians available for disassembly, and personnel familiar with the provisioning documentation. The Contractor should be prepared for disassembly and inspection of the entire system to the LRU level.

The parties at the provisioning conference will discuss spare parts, repair parts, parts-peculiar, tools, test equipment, and other subjects pertinent to the contract. Specific repair and maintenance problems, unusual parts performance, and items for future order will be discussed at the provisioning conference.

2.3.6 Technical Interchange Meetings

Technical Interchange Meetings (TIMs) are those meetings held aperiodically to facilitate the effective and expeditious exchange of miscellaneous technical information. Normally, such exchanges would be accomplished, when practical, either in writing or by telephone. Occasionally, this information is of such volume, complexity, or time-sensitivity, that face-to-face personal communication is the most cost-effective means of exchange.

2.3.7 Technical Instruction Book In-process Reviews

Technical Instruction Book In-process Reviews are conducted to allow AOS to review and comment on draft Technical Instruction Books/Manuals.

2.4 Responsibility For Minutes And Action Items

Whenever a meeting or conference is held, per Contract Data Requirement List (CDRL) responsibility for agendas, minutes, and action item tracking is incumbent upon the prime contractor. In this way, a permanent consensus of what was accomplished at the meeting can be established for future reference and for those program participants who were unable to attend the conference or meeting. If a CDRL does not apply to a particular meeting/conference, an organization or individual will be designated by the Chairperson to generate and distribute the minutes as agreed upon by the attendees. The Chairperson will further be responsible for action item tracking.

2.5 LSA Program Goals

The goal of the LSA Program is to define the supportability requirements for the ITWS program equipment identified in the candidate equipment list. This includes providing a basis for defining the quantity of spares, acquisition of support equipment, generation of technical manuals and training personnel for timely implementation of the maintenance concept. LSA program tasks will be accomplished in accordance with (IAW) Logistics Support Analysis, MIL-STD-1388-1A, and Logistics Support Analysis Record, MIL-STD-1388-2B.

2.6 LSA Program Tasks

The LSA program provides a systematic analysis technique to be used by all logistics elements. LSA fir ITWS will include the following tasks:

a. Task 102 - Logistics Support Analysis Plan (LSAP)

b. Task 103.2.1 - Establish Review Procedures

c. Task 103.2.4 - LSA Review

d. Task 301.2.4 - Operations and Maintenance Tasks

e. Task 303.2.2 - Support System Tradeoffs

f. Task 303.2.7 - Repair Level Analysis

g. Task 401.2.8 - Provisioning Requirements

h. Task 401.2.11 - LSAR Updates

i. Task 401.2.12 - Provisioning Screening

j. Task 403 - Post Production Support Analysis

k. Automation documentation and integrated data base LSAR

The approach for assuring a cost-effective support system for the ITWS will involve completing LSAR documentation IAW the CDRL (as specified in MIL-STD-1388-1A, Notice 4; DD Form 1949-3 Part I and Part II) and the Statement Of Work (SOW). This approach takes into account all hardware items, i.e., items which may or may not be FAA repaired or provisioned. Since the ITWS is COTS, the LSA tasks for the hardware items will be minimized.

2.6.1 Task Descriptions for Reviewing Organizations

Initial LSA activity will focus on maintenance concepts and other strategic decisions that affect early system design and supportability. At succeeding reviews of the program, Critical Design Reviews (CDR) and NAILSMT meetings, the LSA analysis will be reviewed to verify that it continues to support the development of an efficient Logistic Support Program for the ITWS product. The LSA effort will continue to track logistics support requirements, resource utilization, and maintainability data for all approved LSA candidates used in the ITWS.

2.6.2 LSAR Data Base Description

The LSAR data base is the central repository for all data relating to the LSA Program and is the means for purchasing provisioning data. It begins with the baseline data provided by the FAA in the System Level Specification (SLS) to support the analysis effort. Updating an LSA record may be required as a result of:

a. Internal contractor review of LSA documentation,

b. FAA review of LSA documentation,

c. A change in source data or approved Change Request (CR) which must be reflected in the LSAR, or

d. An FAA approved NCP or directed ECP which would cause a change in one or more LSAR forms.

2.6.3 Verification of LSAR Data

LSAR data shall be reviewed and evaluated initially by contractor LSA analysts and then reviewed by the FAA at periodic LSA reviews. The processes or sequential maintenance steps and elapsed time will be determined as each newly identified equipment is demonstrated.

Chapter 3. Maintenance Planning

Developing a Maintenance Requirements Document (MRD) is a subset of NAILS functions and analysis, involving a number of tasks that generate data to support logistics planning. LSA tasks associated with maintenance include the 300 and 400 series tasks. These tasks will be tailored to support COTS acquisitions to generate data necessary to support maintenance planning.

The challenge with respect to a maintenance plan for COTS procurements will be how best to use existing commercial or other maintenance and support systems. Among the factors that will influence this decision are:

- The degree to which manufacturers or other sources already provide maintenance support to existing customers.

- Responsiveness of such support activity to meet FAA requirements (mean logistical down time, need of priority service, surge, etc.).

- The degree to which the FAA will be able to provide site maintenance support, and the need for support facilities or a training with a rotational base for FAA technician personnel.

- A need to minimize "down time."

COTS manufacturers must be able to support their products through preventive maintenance, spare parts, and technical assistance throughout the item's expected service life.

Support scenarios could include the following strategies:

- Return LRUs to factory for repairs (CRS - Contractor Repair Service).
- Provision test equipment, procedures and parts for depot-level repair.
- Provision test equipment, procedures, and parts for user LRU replacement.
- On-site technical support (ICMLS - Intrm Cont Maint & Log Support).
- Any combination of the above.

3.1 Maintenance Requirements

ITWS's maintenance requirements are defined in the Maintenance Requirements Document attached as Appendix F.

3.1.1 Quantitative Design Requirements

3.1.1.1 Availability

ITWS service to the NAS user/specialist is designated as an essential service. Essential service is that service or function which, if lost, would greatly reduce the capability of the NAS to exercise safe separation and control over aircraft. To achieve the essential services availability requirements of <u>NAS System Requirements Specification</u>, NAS-SR-1000, the ITWS subsystem shall be designed to achieve a minimum Inherent Availability (A_i) of .99981.

3.1.1.2 Reliability

The ITWS subsystem shall have a minimum Mean-Time-Between-Failure (MTBF) requirement of 2704 hours.

3.1.1.3 Maintainability

The Mean-Time-To-Repair (MTTR) for the ITWS shall not exceed 0.5 hours. This period includes all time necessary to localize, repair, test, and restore a failed system/unit to its established baseline performance once on-site repair activity has begun.

3.1.1.4 Maintenance Action Limitation

The ITWS shall be designed so that all maintenance requirements/actions can be accomplished using no more than eight (8) annual site visits per system; four (4) maximum for preventive maintenance, and four (4) maximum for corrective maintenance.

Preventive maintenance for ITWS shall be minimized to the maximum extent possible. Total time to complete all periodic tasks shall not exceed 12 staff hours annually; nor shall any periodic maintenance event require more than one (1) person to accomplish the task.

3.1.2 Qualitative Design Requirements

The ITWS will incorporate built-in-test (BIT) capability in order to assist the maintenance technician in fault isolation.

To further the effectiveness and efficiency of remote maintenance monitoring, the ITWS has adopted the concept of modularity in system design to enable field personnel to quickly correct equipment failure on-site by simply replacing a faulty LRU.

A Remote Maintenance Monitoring System (RMMS) is being implemented throughout the National Airspace System (NAS) for the purpose of enhancing the integrity of the NAS, reducing maintenance and support costs, and minimizing the impact of equipment failures. Therefore, all new NAS equipment/subsystems are candidates for RMMS capability if incorporation of RMMS capability is cost effective. The ITWS will include RMMS capability and monitor, command, and control functions. The following are minimum RMMS monitoring capabilities.

　　　1) Status. Provide real-time facility/service (alarm/alerts) information to the control point(s) (normally the controlling Maintenance Control Center (MCC)).

　　　2) Control. Provide facility/equipment reconfiguration and reset/recycle capabilities through the remote command and control functions to ensure service availability and facilitate remote restoration.

　　　3) Performance. Provide performance and trend analysis data needed to satisfy remote certification requirements, verify system integrity, and support predictive failure analysis from the designated MCC.

　　　4) Fault Isolation. Execute/retrieve remote diagnostics to facilitate fault isolation to the LRU including the Remote Maintenance Monitoring (RMM) subsystem(s).

3.2 Maintenance Concept

Maintenance support for ITWS will be guided by FAA Order 6000.30B, Policy For Maintenance Of The National Airspace System (NAS) Through the Year 2000. This order establishes a maintenance policy for NAS systems and subsystems which require two-level maintenance, i.e., field and depot. The initial maintenance concept generally accepted for most COTS acquisitions is to provide each site with the capability for fault isolation to the Line Replaceable Unit (LRU) level.

3.2.1 Field Functions/Responsibilities

Field level maintenance consists of all maintenance activities performed on equipment installed in its operating environment, and includes both preventive and corrective maintenance. The site maintenance technicians remove and replace the faulty LRU(s), restore system to normal operation and certify as necessary, and forward the faulty unit(s) to the depot for exchange and repair (E&R).

The contractor shall provide interim field level maintenance and logistics support (ICMLS) beginning with the first site installation, and continue for two years after last site installation.   The FAA will then assume full responsibility for field maintenance.

3.2.2 Depot Functions/Responsibilities

Depot level functions include providing E&R service to sites returning failed LRUs, performing repairs on failed LRUs, and stocking units for direct exchange purposes.

The contractor shall provide depot level support beginning with the first system installation and continuing for a period not to exceed two years after installation of the last ITWS. After that period, depot repair of LRUs may, at the option of the FAA Logistics Center (FAALC), be accomplished by FAALC, by the prime/production contractor, or by a third party contractor. FAALC will determine whether contractor or organic follow-on LRU repair is most cost effective for the ITWS.

3.2.3 Second Level Engineering Support Functions/Responsibilities

Second level engineering support includes providing assistance in facilities restoration; second level engineering support to the Airway Facilities (AF) technician at the field site; hardware and application software functional/system integration/regression testing; configuration management once a system is fielded; validation of technical manuals or technical instruction books; and preparation, validation, and updating of maintenance technical handbooks. The Operational Support Service (AOS-250) provides second level engineering support to field sites

3.2.4 Interim Contractor Maintenance and Logistics Support

Initial hardware/software field and depot level maintenance for ITWS will be provided through Interim Contractor Maintenance and Logistics Support (ICMLS). Support will consist of periodic maintenance work, performance of modifications, fault isolation, removal and replacement of failed LRUs, repairs of failed LRUs, including repair parts and all system consumables, and other corrective activity. ICMLS begins upon Contractor Acceptance Inspection (CAI) of the first system and extend for two years following installation of the last ITWS. Optional periods of ICMLS may be included as contract options. ITWS sparing decisions will be made by the FAA based on maintenance requirements, sparing models (which include LRU parameters of predicted failure rates, quantities per system, and operating times), and any special depot requirements. The contractor is to provide all maintenance (both hardware and software) and logistics support until FAA technicians are adequately trained to maintain the equipment. ICMLS will be funded by the ITWS Program Office. The Contractor will be required to develop a six month maintenance/support plan to transition all site ICMLS activities to the FAA. This plan will be engaged during the final months of Contractor site support.

3.3 Warranty Program

Determination for inclusion of a warranty in the contract(s) will be made prior to the release of the RFP. This will allow the FAA to assess the technical and contractual risk involved. On the basis of this assessment a decision will be made as to whether or not to include a warranty clause in the contract.

Chapter 4. Supply Support

This section describes the concept used in providing supply support for spares and repair parts necessary to accomplish the ITWS maintenance program. The Logistics Center Spares Quantification Model will be used to predict initial spares requirements. This data will be significant in estimating follow-on provisioning needs as well. While previous user experience, manufacturer observations, and model projections are expected to be of great value, these characteristics can be modified by usage factors (such as service life, environment, and other elements) that may differ between the intended application and the actual design application. A full compliment of site spares will be provided at the time of ITWS fielding and both schedule A and B items will be available. Depot spares will be determined when depot support is finalized.

4.1 Provisioning Strategy

With the exception of the TDWR display, ITWS hardware will be predominantly COTS. The impact of using COTS hardware may be considerable. Modular construction of commercial items often requires unique repair parts. When significant, cost-effective alternative methods should be investigated and implemented. The following are three alternatives which could be considered.

- Manufacturer provides storage and distribution of spares and repair parts.
- Prime system contractors provide supply support.
- Life Cycle procurement and FAA control of certain unique repair parts

with extremely high MTBFs.

4.1.1 Spare Parts Requirements

The contractor shall be required to recommend ITWS spares and parts peculiar according to MIL-STD 1388-2B, and Spare Parts-Peculiar, for Electronic, Electrical, and Mechanical Equipment, FAA-G-1375c.

4.2 Provisioning Technical Documentation Deliverables

The Contractor shall be required to deliver all Provisioning Technical Documentation (PTD) deliverables to FAALC in electronic media as noted in the table below. All reports will be generated at FAALC. The PTD will be used to determine the range and depth of parts and support equipment requirements. Provisioning data will be extracted from LSA "H" tables and submitted in a LSA relational data table format. This will assure consistency with the related reliability, maintenance engineering, and task analysis as well as with the identified support and test equipment requirements.

Table 5: PTD Incremental Deliveries

Increment A--Long Lead Time Items List (LLTIL), Tools and Test Equipment List (TTEL) and Support Equipment list (SE).

Increment B--Short Form Provisioning Parts List (SFPPL)

Increment C--Provisioning Parts List (PPL), Common and Bulk Items List(CBIL), and Interim Support Items List (ISIL)

Increment D--Post Conference List (PCL)

Increment E--All previously delivered information plus any subsequent updates and Design Change Notice (DCN) data and updates.

4.2.1 Design Change Notice Process

Engineering design or part number changes which result in additions, deletions and/or changes to the provisioning data will be submitted IAW the DCN requirements specified in the DD Form 1949-3.

4.2.2 Documentation Screening

The contractor shall screen through the Defense Logistics Service Center (DLSC) all information entered on the HA Data Table for National Stock Numbers (NSN) IAW paragraph 2.210.3 of DOD Provisioning and Other Pre-procurement Screening Manual, DOD Manual 4100.38M and DD Form 1949-3, Provisioning Requirements Statement (PRS). Screening results will be documented on the HA Data Table. The contractor may be required to furnish Fed-Std-5f (Standards Guides For Preparation of Proposal Item Logistics Data Records) Item Identification IAW MIL-STD-1388-1A. Items identified as proprietary IAW MIL-STD-1388-2B, shall be clearly marked and identified **"Proprietary".**

4.3 Site Spares

4.3.1 Site spares

Site spares will include LRUs located with the equipment at the field site. A list of these spares will be included in Appendix E following CDR.

4.3.2 Schedule A & B

Schedule A (common tools) and Schedule B (facilities equipment) will be provided by the PMO.

4.3.3 Depot Spares List

The depot serves as the central supply point and provides a source of replenishment stock for failed LRUs and common consumable parts. In addition to LRUs and common parts, the depot facility also stocks selected items not expected to fail frequently enough to justify storage at lower levels, but which are critical in avoiding down time due to long procurement delays. A list of required depot spares will be included in Appendix E when they are identified at the provisioning conference.

Chapter 5. Support Equipment

5.1 Site and Depot Test and Support Equipment

The Contractor shall provide a list of all required test equipment at CDR.

5.1.1 Site Test Equipment

Site (Common) test equipment will be provided to the field as systems are installed.

5.1.2 Depot Test Equipment

Whenever possible, the Contractor shall satisfy support and test equipment requirements with items currently in the Government inventory as shown in the list below. The Contractor shall require final approval by the Government on ATE selection to prevent unnecessary proliferation of types and quantities of ATE in the FAA inventory.

ATE hardware must operate is a satisfactory manner with any of the following ATE equipment:

>   a. Teradyne 300 Series
>   b. Schlumberger 790 Series
>   c. Combinational Tester approved by the Government

The Contractor shall deliver all test program sets (TPS) and test fixtures required to test/repair LRUs on proposed ATE hardware. TPS's shall include all hardware, software, and procedures for isolation and troubleshooting for each ATE device which is involved in the test procedures. The Contractor shall install, debug, and demonstrate the capability of the software and test fixtures to test all LRUs.

5.2 Contractor Support Equipment Management Responsibilities

A Tools and Test Equipment List (TTEL) will describe tools and test equipment (TTE) used for site and depot repair. Tools used in support of contractor repair service will be owned and maintained by the support contractor. Calibration of system support or test equipment used by the contractor shall be the responsibility of the contractor during the period of contractor maintenance. Calibration of site equipment will be accomplished by FAA personnel after the FAA assumes responsibility for site maintenance

Chapter 6. Training, Training Support and Personnel Skills

This section summarizes the training requirements for the ITWS Program and provides information which will contribute to the planning, management, development, and implementation of ITWS training. Training shall be developed by the ITWS contractor and initially presented in a series of contractor courses. Subsequent training shall then become the responsibility of AMA-400 (AF) and on-site training representatives (AT). Airway Facilities and Air Traffic training requirements shall be developed and validated by AFZ-100 and ATZ-110, respectively, in conjunction with AMA-400 and 500.

ITWS training shall be developed IAW with FAA-STD-028B, Contractor Training Programs, and shall be modular in nature. Initial ITWS AF training shall be conducted by the contractor and then transitioned to AMA. Initial AT training shall be presented on-site to a cadre of AT personnel, who shall then be responsible for completing site training requirements. When ITWS is deployed nationally, the contractor will reinitiate the training development process to identify and develop new modules which address those hardware configuration changes introduced by new equipment. Newly developed modules will then replace outdated modules to form new training courseware for update training.

6.1 Air Traffic Training Requirements

6.1.1. Job Categories

1. Air Traffic Control Specialists (ATCS)
2. Traffic Management Coordinators (TMC)

6.1.2. Training Assumptions

1. ITWS Air Traffic Control (ATC) training shall be conducted by the Contractor on-site.
2. The training shall be conducted away from the operational environment.
3. Students will have prerequisite knowledge and skills in the use of TDWR, LLWAS Ribbon displays, ASOS and ASR-9 weather channel.
4. Students are proficient in weather dissemination procedures that ITWS provides.

6.2 Air Traffic (AT) Training Courses

Many ITWS products are advancements of those found in TDWR, therefore, the display presentation of both systems is similar. Controllers are not, however, familiar with new predictive data which will be introduced in the ITWS graphics area. Operators will receive a hands-on briefing which will familiarize them with ITWS product availability

and display functionality, in addition to addressing the recommended uses of ITWS predictive data graphics.

    a. Course Number: N/A.

    b. Course Requirements: The briefing shall be developed utilizing Contractor's Best Practice methods. The briefing should emphasize functionality and how to access the various menus(windows) to display a specific product on command or to change the configuration of the display; i.e. range marks. All features of the display shall be included in the briefing.

    c. Course Description: To Be Determined (TBD)

    d. Course Objectives: Upon completion of the briefing, the student shall at a minimum be:

        1. Able to describe all features of the Operator Situation Display.

        2. Familiar with the purpose and use of the Countdown Timer Product Area and how they relate to the Airport Terminal Information System (ATIS).

        3. Able to describe the use of the Alert Panel Area.

        4. Able to describe the Graphics Display Area including prediction graphics.

        5. Familiar with the location of the Time/Date and System Status Areas.

        6. Be familiar with the Other Functions Area.

        7. Able to interface with the Product Selection Area through use of the selection device, whether keyboard, trackball, or mouse, ITWS weather products on command.

        8. Familiar with the availability of all ITWS weather products and how they possibly can be used for ATC purposes. These products include:

- Microburst detection and prediction.
- Wind shear detection and prediction.
- Storm cell information, motion and extrapolation.
- Airport surveillance Radar Model 9 (ASR-9) precipitation with anomalous propagation flagged.
- ITWS precipitation with anomalous propagation removed.
- Airport lightning warning.
- Winds aloft in the terminal area.
- Tornado vortex signature detection.
- Terminal weather text messages.

- Long-range storm cell information, motion, and extrapolation.
- Long-range precipitation.

    e. Course Prerequisites: Must be a GS-2152 Traffic Management Coordinator (TMC), or ATCS supervisor. It is recommended that at least one staff specialist or manager with a Facility Instructor Training background be included in the class.

    f. Number to be trained:

- AMA-500:	Two (2) FAA Academy ATC Instructors.
- ATC field personnel:	Four (4) cadre per site.
- Headquarters:	Four (4) cadre at Air Traffic System Command Center (ATSCC).

    g. Materials and Equipment

        - Equipment: Students shall be briefed (indoctrinated) on actual production ITWS systems on-site, and away from the operational environment.

        - Manuals: An Operator Manual shall be made available to each student during the briefing. At least two manuals shall be provided to the facility manager for recurrent and new-hire training.

        - Software: N/A

        - Tools, and Test equipment: N/A.

        - Training Materials: Instructor lesson plans and viewgraphs shall be developed by the Contractor for use during the briefing. At least one copy of the lesson plans, and one copy of the viewgraphs shall be made available to the Air Traffic facility manager for use in recurrent and new-hire training.

6.3 Air Traffic Training Program Analysis

    a. Issues: N/A

    b. Alternative Solutions: N/A

    c. Recommendations: N/A

    d. Resolutions: N/A

6.4 Airway Facilities (AF) Training Requirements

Technical training is defined as that training required to provide the knowledge, skills and abilities that enable system specialists to diagnose, isolate, and correct any hardware (H/W) or software (S/W) malfunction in the ITWS.

6.4.1 Training Assumptions

a. OT&E testing and observing personnel must be trained prior to first article OT&E shakedown.

b. The contractor shall provide total preventive and corrective maintenance (ICMLS) beginning with the first site installation, and continuing for a period of two years after last ITWS site installation.

c. Airway Facilities personnel will be responsible for preventive maintenance and corrective maintenance following expiration of contractor support.

d. ITWS will require certification.

e. Some site maintenance personnel must be trained prior to first site JAI/ORD due to system certification requirements.

f. Additional site maintenance personnel will receive training prior to assuming responsibility for site maintenance following ICMLS.

g. Training media will be determined through the training development process.

h. The Operational Tryout Classes (OTC) for both (H/W) and software maintenance courses will be conducted by the contractor(s). The location for these classes will be determined at some future point. The students will receive both H/W maintenance, and the systems operations overview.

I. COTS processing equipment for ITWS has an estimated six-year life cycle and P^3I technology replacement insertions are planned.

j. At system replacement, the Contractor shall be required to re-evaluate training requirements and revise the Academy's courses to address those configuration changes which impact systems operations and H/W maintenance training.

6.4.2 Job Categories

Four separate support functions will require training; (H/W) Maintenance, Depot Level, PSF level, and Operational, Test and Evaluation (OT&E).

6.4.2.1 Hardware Maintenance Training

Site maintenance technicians located at the TRACONS will receive training in both system overview operation, and H/W LRU level maintenance. The Contractor will deliver the first five training sessions to approximately twelve persons each. After Contractor training has been completed, training will transition to AMA.

If an acceptable COTS H/W maintenance training course presently exists, then Contractor format will be acceptable. If the training must be developed, it will be developed IAW FAA-STD-028B and addressed in this part of the ILSP using the following format:

Training Courses:
        a. Course Title/Course Number
        b. Course Requirements
        c. Course Description
        d. Course Objectives
        e. Prerequisites specific to the course
        f. Number of personnel to be trained

Qualified AF Field Personnel	XX
Depot	XX
FAATC	XX
Headquarters	XX
AMA-400	XX
Total	XX

        g. Materials and Equipment
            (1)   Operational equipment
            (2)   Manuals
            (3)   Software
            (4)   Tools, test equipment
            (5)   Training materials

6.4.2.2 Depot Level Training

If FAALC elects to accomplish LRU repair, they will require training to the component level. Training will be a one-time presentation in the Contractor's format.

Training Courses:
        a. Course Title/Course Number
        b. Course Requirements
        c. Course Description
        d. Course Objectives
        e. Prerequisites specific to the course
        f. Number of personnel to be trained

Qualified AF Field Personnel	XX
Depot	XX
FAATC	XX
Headquarters	XX
AMA-400	XX
Total	XX

g. Materials and Equipment
  (1)   Operational equipment
  (2)   Manuals
  (3)   Software
  (4)   Tools, test equipment
  (5)   Training materials

6.4.2.3 Software Maintenance Training

AOS-250 personnel require software maintenance training to enable them to provide field site second level engineering support and the ability to accomplish any future software/hardware upgrade or modification. Training will be a one-time presentation in the Contractor's format and will be presented after fielding is complete to coincide with the termination of ICMLS.

Training Courses:
  a. Course Title/Course Number
  b. Course Requirements
  c. Course Description
  d. Course Objectives
  e. Prerequisites specific to the course
  f. Number of personnel to be trained

Qualified AF Field Personnel	XX
Depot	XX
FAATC	XX
Headquarters	XX
AMA-400	XX
Total	XX

g. Materials and Equipment
  (1)   Operational equipment
  (2)   Manuals
  (3)   Software
  (4)   Tools, test equipment
  (5)   Training materials

6.4.3 Operational Test And Evaluation Training

AOS personnel who will perform Operational Test and Evaluation will require separate training. Training content shall be the same as that provided for systems operations overview and (H/W) maintenance. Contractor's format will be acceptable.

6.4.4 RMMS Training

As a candidate for RMMS, ITWS must consider training necessary to accomplish the remote maintenance function. Full details concerning regional/center training requirements will be examined when the ITWS RMMS design is finalized.

6.5 Airway Facilities Training Program Analysis

No Airway Facilities training program analysis has been conducted as yet. When such an analysis is done, relevant information will be addressed in this part of the ILSP using the following format:

    a. Issues

    b. Alternative Solutions

    c. Recommendations

    d. Resolutions

6.6 Training Equipment/Facilities Requirements

Current plans are for the existing TDWR facility to be expanded to support ITWS training requirements. The following requirements must still be identified:

    a. Academy test & support equipment

    b. Long lead time items.

    c. Training system configuration.

    d. Training labs and classrooms.

Chapter 7. Direct Work Maintenance Staffing

7.1 Field Site Direct Work Maintenance Staffing

Direct Work Maintenance Staffing activities begin during formulation of the operational concept. Unlike new developments, COTS acquisitions limit options because the acquisition is for a defined end-product or component.

7.1.1 Direct Work Maintenance Staffing Requirements

AFZ-200 will perform a staffing study in order to identify maintenance and support staffing impact and requirements.

A preliminary engineering estimate will be developed and entitled "(DRAFT) Staffing Standard". This standard will be considered a Future Facility Estimate based on available data presented for review and examination at the time of development. It will identify the employee hours or fractions thereof to maintain the ITWS. Both preventive and corrective maintenance requirements are included along with ancillary tasks as defined in FAA Order 1380.40C, Airway Facilities Sector Level Staffing Standard System; Chapter Three.

Table 6: Field Site Staffing Requirements

Recurring direct time values (Hours)	New	Old
Periodic Maintenance		
Electronic (PMET)	_____	_____
Environmental (PMEV)	_____	_____
Corrective Maintenance		
Electronic (CMET)	_____	_____
Environmental (CMEV)	_____	_____
Printed Circuit Board Repair (PCBR	_____	_____
Software (SFTW)	_____	_____
Monitor Function		
Periodic Maintenance (PMMON)	_____	_____
Corrective Maintenance (CMMON)	_____	_____
Other		
Modification (MOD)	_____	_____
Technical Inspection (TI)	_____	_____
Flight Inspection (FI)	_____	_____
Access Roads (ROAD)		
Field Maintenance Projects (FMP)	_____	_____
Special Maintenance Projects (SMP)	_____	_____
Total Annual Recurring Hours	_____	_____
	00.0	00.0

Recurring direct time values (Hours)	New	Old
Prior to Commissioning		
Fac & Eng (F&E) Installation assist (FS6M)	_____	_____
Initial Training (TNG6M)	_____	_____
Flight Checks (FLT6)	_____	_____
First Year of Commissioning		
Clear Joint Acceptance Inspection (JAI)	_____	_____
Infant Mortality Corrective Maintenance		
Electronic (ETY1)	_____	_____
Environmental (EVY1)	_____	_____
Total Annual Non-Recurring Hours	_____	_____
	00.0	00.0

7.1.2 Staffing File Update Requirements

A unique set of Facility Codes (FACCODE) have been developed and will be entered into the Pre-commissioned Facility File (PFF).

Upon review and approval of the draft standard by the Staffing Standards Change Control Team (SSCCT), the employee year requirements will be entered into the Staffing Value File (SVF) and will remain as an historical record for the ITWS until such time as it is reviewed and updated.

The contractor shall provide a worksheet in the format shown in the table below, to reflect the projected workload. Any changes from existing data will be provided to regional maintenance offices for input to the SVF.

7.2 Logistics Support Direct Work Maintenance Staffing Requirements

The following table reflects staffing numbers, grade levels and series for personnel necessary to support the depot.

Table 7: Depot (Logistics) Staffing Requirements

Logistics Center Personnel	Quantity
XXXXXXXXX	XXXXX
XXXXXXXXX	XXXXX

Chapter 8. Maintenance Facilities

This section describes space and facility requirements for maintaining ITWS components, storage space for spares and support equipment requirements.

Introducing a new system or equipment into the NAS inventory requires careful evaluation of depot facility requirements. Such evaluation is important for both COTS as well as agency developed systems. With COTS, however, two factors, compressed schedule and non-FAA design, increase the demands of facilities planning. It is important that early logistics considerations include: defining the types of facilities, facility improvements, locations, storage space, and environmental requirements necessary to support the COTS.

Site surveys will be conducted by the contractor. Once they are completed, the resulting findings will be addressed in the following three broad categories:

- Academy Requirements
- Depot Requirements
- Field requirements

8.1 Site Maintenance Facilities

We anticipate that existing facilities will be adequate and new construction/ modifications will not be necessary because of the co-location of ITWS components with other electronic systems. Final requirements will be refined following completion of site surveys.

8.2 Logistics Center Facilities

Following the decision concerning "contractor vs. FAALC organic LRU repair", the adequacy of the FAALC's facilities for LRU repair will be determined. Those requirements will be then identified in this area of the ILSP. Facility requirements for storage of spares will be provided to the depot when spares requirements modeling is completed.

8.3 Program Support Facility

8.3.1 Program Support Facility (PSF)

The ITWS PSF shall include all of the equipment, supporting software, firmware, and documentation (including revisions and upgrades) required for the generation, maintenance, testing, analysis, and debugging of all the ITWS functional software in accordance with the ITWS Specification, FAA-E-XXXX. Operation, maintenance and vendor data manuals for PSF equipment shall also be provided in accordance with

FAA-D-2494/b concurrent with the PSF delivery. The ITWS PSF shall execute the ITWS operational programs for test and debugging purposes. The physical facility will be provided by the Government and present plans call for expanding the existing TDWR PSF for this purpose.

8.3.2 PSF Requirements

The Contractor shall deliver, install, and perform acceptance test of the PSF at the FAA Aeronautical Center. All software delivered as part of the ITWS shall be compiled and generated using the PSF equipment required by FAA-E-XXXX. The PSF shall be capable of supporting the functional and performance requirements of the ITWS. The Contractor shall provide to the Government a Computer Resources Integrated Support Document (CRISD). The CRISD provides information that is required to perform the life cycle support for the contractually deliverable software.

8.4 FAA Technical Center

Requirements for facilities at the FAA Technical Center have not yet been determined.

Chapter 9. Packaging, Handling, Storage and Transportation

This section describes the packaging, handling, storage, and transportation (PHS&T) requirements necessary to support the ITWS equipment and spares.

9.1 Packaging Requirements

9.1.1 Packaging Required for Site Items.

All components and equipment (except spares) with a consignee other than FAALC shall be preserved, packaged, and packed in accordance with ASTM-3951, "Standard Practice for Commercial Packaging". Spares shall be preserved and packaged Level A and packed Level C in accordance with MIL-STD-2073-1B, "DOD Material Procedures for Development and Application of Packaging Requirements", Appendix A.

9.1.2 Packaging Required for FAALC Items.

All components and equipment (except spares) shall be individually preserved and packaged Level A and packed Level B in accordance with MIL-STD-2073-1B, Appendix A. Spares shall be preserved and packaged Level A and packed Level C in accordance with MIL-STD-2073-1B, Appendix A.

9.1.3 Electrostatic Discharge Sensitive Items

Certain types of electrical and electronics parts are susceptible to electrostatic discharge (ESD) damage. ESD sensitive items will be packaged IAW MIL-STD-2073-1B, Appendix A.

9.1.4 Marking

All components, equipment, and spares with a consignee other than FAALC shall be marked in accordance with ASTM-3951. In addition, each unit, intermediate and exterior shipping container shall be marked with the following information:

Table 8: Container Marking Requirements

> (1) National Stock Number (NSN)
> (2) Serial Number
> (3) Part Number
> (4) Contract Number
> (5) Contract Line Item Number (CLIN)
> (6) Warranty Expiration Date

All components, equipment, and spares consigned to FAALC shall be marked in accordance with MIL-STD-129L, "Marking For Shipment And Storage" and MIL-STD-1189B, "Standard Department of Defense Bar Code Symbology". In addition to these requirements, each unit, intermediate and exterior shipping container shall also be marked with the information required in table 9.1.4.

9.2 Handling

At this time no special handling procedures have been identified for systems/equipment being shipped directly to each designated site/depot.

9.3 Storage

At this time no special storage procedures have been identified for systems/equipment being shipped directly to each designated site/depot.

9.4 Transportation

All shipments shall be made in accordance with Order 4650.22D, "Vendor Shipment of Nationally Furnished Project Materiel". All items will be transported by the most economical means considering dependability, safety, urgency of need and the use of the least costly mode meeting these considerations. Notification in writing of pending shipments consigned to the FAA Logistics Center will be provided at least 30 days prior to the anticipated shipping date. Notice shall include number of pieces, weight and dimensions of each piece in each shipment, and any special storage requirements. Notification shall be made to:

>　　　FAA, MMAC, FAALC
>　　　Storage and Transportation Branch, AML-300
>　　　6500 S. Mac Arthur Blvd.
>　　　Oklahoma City, OK 73125

Chapter 10. Technical Data

This section outlines technical documentation developed by either the contractor or the Government. Technical data for logistics support includes specifications, drawings, technical manuals, calibration procedures and other data required to procure, manufacture, test and inspect, perform preventive and corrective maintenance, operate and repair the item or its parts. The technical data required must complement the maintenance and supply support strategies.

Technical data should be procured with unlimited rights to the Government whenever possible. When suppliers claim proprietary rights in data, the APML should carefully review the data requirements to ensure that expensive and unnecessary rights in data are not procured.

10.1 Technical Data Requirements

The following technical documentation will be required from the contractor to support the ITWS Program maintenance concept:

     a. Software design documents and user manuals IAW the requirements outlined in Defense System Software Development, DOD-STD-2167A, as tailored by the system specification.

     b. Design plans and system architecture for hardware and system interfaces.

     c. Technical Instruction Books (TIB) and other technical documentation (testing, training, maintenance, system installation, and fielding).

     d. System Level Technical Instruction (TI) shall be developed IAW FAA-D-2494/b.

     e. Individual Hardware components will be supplied with vendor manuals in the Contractor's format.

     f. Drawings will be procured IAW Technical Data Packages, General Specification For, MIL-T-31000.

10.2 Technical Manuals and Instruction Books

A system level manual will be developed IAW FAA-D-2494/b. At the equipment level, the technical manuals will consist of materials from the COTS hardware vendor which will be supplemented as necessary. If the FAALC provides depot level support, a component level manual will be purchased.

The contractor shall be required to provide a manuscript plan and a validation plan. These plans will serve as the basis for technical instruction book discussions at the NAILSMT meetings. The manuscript plan shall require at least two in-process reviews, a final (formal) review of the draft manuscript prior to validation, and a final review of the reproducible manuscript following the validation process. The contractor shall be required to deliver draft technical instruction book manuscripts, final draft manuscripts, and reproducible manuscripts.

10.2.1 In-Process Reviews and Quality Assurance Measures

If the contractor is required to develop technical instruction books, regular In-Process Reviews (IPR) will be conducted at the 95% level of completion. These reviews will ensure the adequacy and technical accuracy of the instruction books. If the volume of material to be reviewed is too great, additional IPRs will be scheduled

Validation/Verification of all procedural data and instructions on the actual hardware will be performed by personnel whose skills and knowledge are at the level of the intended user.

10.2.2 Technical Manual/Technical Instruction Book Validation

Validation certification will be conducted IAW FAA-D-2494/b. Before submitting final manuscripts, all technical data will be verified using the operational concept of ITWS programs. The signed certification will accompany the validated manuscripts to the FAA.

10.2.3 Instruction Book Revisions and Updates

To facilitate updates, completed manuals will be provided on magnetic media. After acceptance of these technical manuals, AOS-250 will be responsible for any subsequent revisions or updates required.

10.3 Technical Data Package

The contractor shall be required to provide a Technical Data Package (TDP) prepared in accordance with MIL-T-31000 to assist in re-procurement efforts. The technical data package will include the following items as a minimum:

    Commercial Drawings and Associated Lists
    Product Drawings and Associated Lists (if modified COTS)
    Depot Level Repair Specifications
    Software and Software Documentation

Upon delivery, the technical data package should include all data necessary to enable the Government to re-procure LRUs competitively. ALM-460 will review the TDP for accuracy.

10.4 Software Documentation

10.4.1 Functional Software Programs

The contractor shall deliver a complete set of all the programs, including sub-programs, that are required to enable the ITWS to accomplish the operational performance specified in the system specification.

10.4.2 Commercial Off-the-Shelf Software and Firmware

The contractor shall provide any COTS software and other special software used to manage, develop, design, and modify the ITWS equipment, and firmware such as programmable read only memory (PROM) and erasable programmable read only memory (EPROM).

10.4.3 Software User's Manual

The contractor shall provide a Software User's Manual (SUM) for the ITWS in accordance with DOD-STD-2167A.

10.4.4 Computer System Operator's Manual

The contractor shall provide a Computer System Operator's Manual (CSOM) for the ITWS in accordance with FAA-D-2494/b, Appendix I.

10.4.5 Software Programmer's Manual

The contractor shall provide a Software Programmer's Manual for the ITWS in accordance with DOD-STD-2167A.

10.4.6 Firmware Support Manual

The contractor shall provide a Firmware Support Manual for the ITWS in accordance with DOD-STD-2167A.

10.4.7 Electronic Format

All software support supplied to the Government in electronic form shall be in the AEGIS format.

10.5 Configuration Management

Configuration management and control functions will be IAW National Airspace Configuration Management, FAA Order 1800.8F, and Configuration Management, FAA-STD-021A. COTS must be carefully evaluated when considering other alternatives. In time, users other than the FAA may force modifications to the COTS that affects the FAA's ability to support the item. Such possibilities will require close scrutiny by the appropriate reviewing element to support decision makers and to allow flexibility and adaptability of NAILS planning. The ability of the FAA to adjust to possible configuration changes that are beyond its control is an important consideration for COTS acquisitions.

The solicitation for the Full Scale Development (FSD) Phase/KDP-3 will include the requirements for the contractor's plan for configuration management of both the software development and COTS equipment. The program office will ensure their plans are prepared as outlined in FAA-STD-021A, Configuration Management. The plans must address configuration identification, configuration control, status accounting, and configuration audits.

Chapter 11. Milestone and Schedules

Table 9: Program Milestone Schedule

Activity	Planned/Completion Date
Demonstration/Validation: Memphis	07/94
Demonstration/Validation: Orlando	08/94
Major Acquisition Review (MAR)	09/94
Test Policy Review Committee (TPRC)	03/30/95
KDP-3: Acquisition Review Committee (ARC)	04/13/95
KDP-3: Trans. Sys. Acq. Rev. Cncl. (TSARC)	05/02/95
SOW Completed	06/95
"A"-Specification Approval	06/95
RFP Release	08/95
Contract Award Full Scale Development (FSD)	08/96
Critical Design Review (CDR)	10/97
DT&E FAT	05/99
Ship and install FSD First Article (FAA Tech Center)	06/99
DT&E SAT	07/99
Operational, Test, and Evaluation (OT&E)(Shakedown)	12/99
KDP-4: ARC	02/00
KDP-4: TSARC	04/00
Exercise Full Scale Production (FSP) Option	05/00
Produce first FSP Unit	06/00
PAT & FAT	08/00
OT&E Shakedown	08/00
First Field Shakedown CAI/IOC	09/00
JAI/ORD	09/00
Last Delivery	11/01
Last Field Shakedown CAI/ORD	12/01

Table 10: ILS Program Milestone Schedule

Activity	Month Year
NAILSMT	2/15/95
Field Development Site Surveys	TBD
Start ICMLS	09/2000
End ICMLS	12/2003

APPENDIX A: REFERENCES

The following specifications, orders, and publications are pertinent to this ILSP or contain information related to ITWS program integrated logistics support.

ITWS Reference Documents:

                Mission Need Statement
                Maintenance Requirements Document (draft)
                Operational Requirements Document
                Acquisition Plan

ASTM-3951	Standard Practice for Commercial Packaging
DOD 4100.38-M	DOD Provisioning and Other Pre-procurement Screening Manual
DOD-STD-2167A	Defense System Software Development
FAA-D-2494/b	Technical Instructional Book Manuscript: Electronic, Electrical, Mechanical equipment, Requirements For Preparation of Manuscripts and Production of Books
FAA-E-XXXX	ITWS Specification
FAA-G-1375c	Spare Parts-Peculiar for Electronic, Electrical, and Mechanical Equipment
FAA Order 1100.2C	Organization-FAA Headquarters
FAA Order 1100.5C	FAA Organization-Field
FAA Order 1380.40C	Airway Facilities Sector Level Staffing Standard System
FAA Order 1800.58A	National Airspace Integrated Logistics Support Policy
FAA Order 1800.8F	National Airspace Configuration Management
FAA Order 4650.22D	Vendor Shipments of Nationally Furnished Project Materiel
FAA Order 6000.15B	General Maintenance Handbook for Airway Facilities
FAA Order 6000.30B	Policy for Maintenance of the National Airspace System (NAS)

FAA Order 6000.38	Policy to Determine NAS Equipment Initial Sparing Requirements For Airways Facilities Work Center and Field Locations
FAA Order 6000.41	Policy Governing Contractor - Assisted Maintenance for the National Airspace System
FAA Order 6030.31E	Restoration of Operational Facilities
FAA-STD-021A	Configuration Management
FAA-STD-028B	Contract Training Programs
Fed-Std-5f	Standards Guides For Preparation of Proposal Item Logistics Data Records
MIL-STD-129L	Marking for Shipment and Storage
MIL-STD-1189B	Standard Department of Defense Bar Code Symbology
MIL-STD-1388-1A	Logistics Support Analysis
MIL-STD-1388-2B	DOD Requirements For a Logistics Support Analysis Record
MIL-STD-2073-1B	DOD Material Procedures for Development and Application of Packaging Requirements
MIL-T-31000	Technical Data Packages, General Specification For

APPENDIX B1: ABBREVIATIONS/ACRONYMS

The following abbreviations and acronyms are used, or are related to elements in this document.

AAF	Airways Facilities Services
AAL	Alaskan Region
ACE	Central Region
ACF	Area Control Facility
ADAS	AWOS Data Acquisition System
ADW	Andrews Air Force Base
AEA	Eastern Region
AF	Airways Facilities
AFZ	Office of Resources Management
AGFS	Aviation Gridded Forecast System
AGL	Great Lakes Region
A_i	Inherent Availability
ALM	FAA Life-Cycle Management Directorate
AMA	FAA Academy
AMC	M/M Aeronautical Center, Oklahoma City
AML	FAA Logistics Center (M/M Aeronautical Center, Oklahoma City)
ANE	New England Region
ANM	Northwest Mountain Region
AOS	FAA Operational Support Service Directorate
AP	Anomalous Propagation
APML	APM Logistics
APMP	APM AT Procedures
ARD	FAA Research and Development Directorate
ARTCC	Air Route Traffic Control Center
ASO	Southern Region
ASOS	Automated Surface Observation System
ASR-9	Airport Surveillance Radar - Nine
ASTM	(Standard Practice for Commercial Packaging)
ASU	Acquisition Support Service
ASW	Southwest Region
AT	Air Traffic
ATC	Airport Traffic Control
ATCS	Air Traffic Control Specialists
ATCT	Airport Traffic Control Tower
ATE	Automatic Test Equipment
ATIS	Airport Terminal Information System
ATR	Air Traffic Plans and Requirements Service
ATSCC	Air Traffic System Command Center
ATZ	Office of Air Traffic Program Management
AWDP	Aviation Weather Development Program

AWOS	Automated Weather Observation System
AWP	Western Pacific Region
BIT	Built-In-Test
BWI	Baltimore-Washington International Airport
CAI	Contractor Acceptance Inspection
CBIL	Common Bulk Items List
CDR	Critical Design Review
CDRL	Contract Data Requirements List
CIP	Capital Investment Plan
CLIN	Contract Line Item
CMET	Corrective Maintenance - Electronic
CMEV	Corrective Maintenance - Environment
CMMON	Corrective Maintenance Monitor (Function)
COTS	Commercial-Off-The-Shelf
CR	Change Request
CRISD	Computer Resources Integrated Support Document
CSOM	Computer System Operator's Manual
CRS	Contractor Repair Service
CSU	Channel Service Unit
DCA	Washington, D.C. National Airport
DCN	Design Change Notice
DEMVAL	Demonstration-Validation
DID	Data Item Description
DLSC	Defense Logistics Services Center
DOD	Department of Defense
DSU	Date Service Unit
E&R	Exchange and Repair
ECP	Engineering Change Proposal
EIA	Electronic Industries Association
EPROM	Electronically Programmable Read Only Memory
ESD	Electrostatic Discharge
F&E	Facilities and Engineering
FAA	Federal Aviation Administration
FAALC	Federal Aviation Administration Logistics Center (Oklahoma City)
FAATC	FAA Technical Center (Atlantic City, New Jersey)
FAATSAT	FAA Telecommunications Satellite
FACCODE	Facility Codes
FI	Flight Inspection
FMP	Field Maintenance Project
FSD	Full Scale Development
FSP	Full Scale Production

GFI	Government Furnished Information
GFE	Government Furnished Equipment
GSD	Graphical Situation Display
H/W	Hardware
IAD	Washington Dullas International Airport
IAW	In Accordance With
ICMLS	Interim Contractor Maintenance and Logistics Support
ILS	Integrated Logistics Support
ILSP	Integrated Logistics Support Plan
IOC	Initial Operating Capability
IPB	Illustrated Parts Breakdown
IPR	In-Process Reviews
ISP	Integrated Support Plan
ISIL	Interim Support Items List
ITWS	Integrated Terminal Weather System
JAI	Joint Acceptance Inspection
KDP	Key Decision Point
LCC	Life Cycle Cost
LCN	Logistics Control Number
LLTIL	Long Lead Time Items List
LLWAS	Low Level Winshear Alert System
LORA	Level Of Repair Analysis
LRU	Line Replaceable Unit
LSA	Logistics Support Analysis
LSAP	Logistics Support Analysis Plan
LSAR	Logistics Support Analysis Record
MAF	Multiple Airport Facility
MCC	Maintenance Control Center
MDCRS	Meteorological Data Collection and Reporting System
MIL-STD	Military Standard
MIT/LL	Massachusetts Institution of Technology/Lincoln Laboratory
MMAC	Mike Monroney Aeronautical Center (Oklahoma City)
MODS	Modifications
MPS	Maintenance Processor System
MRD	Maintenance Requirements Document
MTBF	Mean-Time-Between-Failures
MTTR	Mean-Time-to-Repair
NADIN	Nas Data Interchange Network

NAILS   National Airspace Integrated Logistics Support
NAILSMT   National Airspace Integrated Logistics Support Management Team
NAS   National Airspace System
NCP   Notice Change Proposal
NEXRAD   (NWS) Next Generation Weather Radar
NLDN   National Lightening Detection Network
NSN   National Stock Number
NWS   National Weather Service

OJT   On-The-Job-Training
ORD_1 Operational Requirements Document
ORD_2 Operational Readiness Demonstration
OT&E   Operational, Test, and Evaluation
OTC   Operational Tryout Class

P^3I Pre-Planned Product Improvement
PCBR   Printed Circuit Board Repair
PCL   Post Conference List
PFF   Pre-commissioned Facility File
PHS&T   Packaging, Handling, Storage & Transportation
PM   Program Manager
PMEV   Periodic Maintenance-Environmental
PMET   Periodic Maintenance-Electronic
PMMON   Periodic Maintenance Monitor (Function)
PMO   Program Management Office
PPL   Provisioning Parts List
PROM   Programmable Read Only Memory
PRS   Provisioning Requirements Statement
PSF   Program Support Facility
PTD   Provisioning Technical Documentation

R&D   Research and Development
R&R   Repair and Return
RBDT   Ribbon Display Terminal
RFP   Request For Proposal
RIL   Repairable Items List
RMM   Remote Maintenance Monitoring
RMMS   Remote Maintenance Monitoring System
ROAD   Access Roads
RPG   Radar Products Generator

S/W   Software (see also SFTW)
SAF   Single Airport Facility
SCIP   Surveillance Communications Interface Processor
SD   Situation Display
SDU   Situation Display Unit

SE	Support Equipment
SEL	Support Equipment List
SFPPL	Short Form PPL
SFTW	Software (as used by maintenance staffing)
SLS	System Level Specification
SM&R	Source, Maintenance, and Recovery (Code)
SMP	Special Maintenance Project
SVF	Staffing Value File
SSCCT	Standards Change Control Team
SOW	Statement Of Work
SUM	Software User's Manual
T1	1.544 Megabit/second communication circuit
TATCA	Terminal ATC Automation
TBD	To Be Determined
TCCC	Tower Control Computer Complex
TDP	Technical Data Package
TDWR	Terminal Doppler Weather Radar
TI	Technical Inspection
TI	Technical Instruction
TIB	Technical Instruction Book
TIM	Technical Interchange Meeting
TM	Technical Manual
TMC	Traffic Management Coordinators
TPRC	Test Program Review Committee
TPS	Test Program Set
TRACON	Terminal Radar Approach Control Facility
TSARC	Transportation System Acquisition Review Council
TTE	Tools and Test Equipment
TTEL	Tools and Test Equipment List
WSR	Weather System Radar

APPENDIX B2: TERMS AND DEFINITIONS

Acquisition - The process of planning, designing, producing and deploying a system or equipment.

Automatic Test Equipment (ATE) - Electronic devices capable of automatically or semi-automatically generating and independently furnishing programmed stimuli, measuring selected parameters of items being tested and making a comparison to accept or reject the measured values in accordance with predetermined limits.

Calibrate - To verify the accuracy of test equipment and to assure performance is within tolerance, usually compared to a reference standard which can be traced to a primary standard. To determine and make required corrections in instruments or test equipment used in precise measurement.

Channel Service Unit - A digital modem which performs transmit and receive filtering, signal shaping, longitudinal balancing, voltage isolation, equalization, and remote loopback testing for digital transmission.

Configuration Management- The systematic evaluation, coordination, approval or disapproval, and implementation of all approved changes in the configuration of items after formal establishment of its baseline configuration.

Contract Data Requirements List (CDRL) - A contract form listing all data items selected from applicable Data Item Descriptions (DID) which are to be delivered under contract.

Corrective Maintenance - Unscheduled maintenance and repair actions performed as a result of failures or deficiencies to restore the item to a specified condition.

Commercial Off-the-Shelf (COTS) - Any product such as an item, material, component, subsystem, or system, sold or traded to the general public in the course of normal business operations at prices based on established catalog or market prices.

Data Service Unit - Same as a CSU but adds bipolar conversion functions to ensure proper signal shaping and adequate signal strength.

Depot Maintenance - The level of maintenance which includes LRUs, items requiring major overhaul or a complete rebuild of parts, assemblies, subassemblies and end items, including the manufacture of parts, modifications, testing and reclamation as required.

Government Furnished Equipment/Information (GFE/GFI) -Equipment/information in the possession of, or acquired by the government, and subsequently delivered or otherwise made available to the contractor.

Integrated Logistics Support (ILS) - A disciplined, unified, and iterative approach to achieving the integration of support considerations into system and equipment design; the development of support requirements that are directly related to readiness objectives; the acquisition of required support; and the provision of required support during the operational phase at minimum cost.

Integrated Logistics Support Plan (ILSP) - A document that describes the integrated logistics support program requirements, tasks, and milestones for a subsystem/equipment acquisition program, R&D program or major modification program. The ILSP is developed under the direction of the APML with input from the NAILSMT. The ILSP is an iterative document and is updated as the program progresses.

Integrated Support Plan (ISP) - A comprehensive plan, prepared by the contractor, for management of the ILS program requirements contained in the contract Request For Proposal. The ISP is the consolidation of all individual logistics support elements into an interrelated program to provide effective and timely logistics support for a designated system, equipment, or component.

Line Replaceable Unit (LRU) - A depot-repairable item which may consist of a unit, an assembly (circuit card, electronic component, etc.), a subassembly, or a part that, upon its failure, is removed and replaced at the site maintenance level in order to restore the system/equipment to its operational status.

Logistics Control Number (LCN) - An eleven character alphanumeric code that represents a hardware generation breakdown/disassembly sequence of system/equipment hardware including support equipment, training equipment, and installation (connecting) hardware.

Logistics Support Analysis (LSA) - A process by which the logistics support necessary for a new system is identified. It includes the determination and establishment of logistics support design constraints, consideration of those constraints in the design of the "hardware" portion of the system, and analysis of the design to validate the logistics support feasibility of the design. LSA identifies and documents the logistics resources which must be provided to the field as part of the system.

Logistics Support Analysis Record (LSAR) - That portion of LSA documentation consisting of detailed data pertaining to the identification of logistics support resource requirements of a system/equipment. Data element descriptions are contained in MIL-STD-1388-2B.

Mean Time Between Failure (MTBF) - The mean operating time, measured in hours, during which the item performs as specified between failures.

Mean Time To Repair (MTTR) - The total corrective maintenance time divided by the total number of corrective maintenance actions during a given period of time.

National Airspace Integrated Logistics Support (NAILS) - A disciplined approach to plan and integrate support considerations into design, acquire the necessary initial support for the system/equipment, and identify life-cycle support requirements.

National Airspace Integrated Logistics Support Management Team (NAILSMT) - A management team formed to plan, coordinate, and integrate the efforts of all concerned with system/equipment support to ensure that logistics support requirements are identified and satisfied prior to deployment of the system/ equipment.

Organic Maintenance - Maintenance performed in-house by FAA/Government technicians.

Packaging - The use of protective wrapping and cushioning inside containers up to but not including an exterior shipping container. Also includes electrostatic protective wrappings and warning labels for components that are sensitive to damage caused by electrostatic discharge.

Parts Common - An item which is routinely and ordinarily obtainable from one or more sources, including the prime contractor, at the time of contract award. The item must be listed explicitly in a vendor or supplier catalog or be readily available as a bonafide stock item at the time of award of the contract or order, and be frequently manufactured, fabricated, or assembled for common use to Government, industry, or commercial specification, drawing, or standard.

Parts Peculiar - Any item that is designed, developed, assembled, or fabricated by the contractor specifically for use with the end article being procured. An item is parts peculiar if it is not listed explicitly in a published vendor or supplier catalog or is not readily available as a bonafide established stock item at the time the contractor order was placed. A common part that has been modified in any way to accommodate a new environment shall be classified as a parts peculiar. A common part that has been selected for a higher tolerance other than routine production tolerance (such as transistors or integrated circuits) either by the contractor or the contractor's purchase specification shall also be parts peculiar. Common parts that have been selected as a matched set shall also be considered as parts peculiar.

Preventive Maintenance - That category of maintenance that is conducted on a scheduled basis to maintain an item in a specified condition by providing specialized services such as, systematic inspection, detection, and prevention of incipient failures.

Provisioning - The process of determining and selecting range, varieties, and quantities of items, e.g., repair parts, spares, special tools, test and support equipment, that should be procured and stocked to sustain and maintain equipment and systems for specified periods of time.

Provisioning Conference - A meeting of the FAA's provisioning team and the contractor's representatives for the purpose of establishing the FAA's logistics support requirements for the end articles on contract or order.

Provisioning Parts List (PPL) - A list of all support items which can be disassembled, reassembled, or replaced and which, when combined, constitute an end item.

Provisioning Technical Documentation (PTD) - The generic term used to reference various types of Provisioning Lists. The term is used for the identification, selection, and determination of initial requirements and cataloging of support items to be procured through the provisioning process. Applicable PTD is as follows:

> (a) Provisioning Parts List
> (b) Short Form Provisioning Parts List
> (c) Long Lead Time Items List
> (d) Repairable Items List
> (e) Interim Support Items List
> (f) Tools and Test Equipment List
> (g) Common and Bulk Items List
> (h) Design Change Notices
> (i) Post Conference List
> (j) System Configuration Provisioning List

Repairable - The condition of an item which can be returned to service after repair or rework, in accordance with procedures, tolerances and limits established by the overhaul and repair instructions issued by the item manufacturer, or as otherwise authorized by the regulations of the Federal Aviation Administration.

Serviceable - The condition of an item in a good state of preservation that can be placed in service without repair in accordance with applicable manufacturer's overhaul limits and instructions, or as otherwise authorized by regulations of the Federal Aviation Administration.

Shop Replaceable Unit - That part or component below the LRU level that is used during FAALC repair to bring an item back to operational condition; general the item will lose its identity when placed into a higher assembly.

Software - A collection of associated computer programs and computer data required to enable the computer equipment to perform computational or control functions; it is the abstract of tapes, disks, card decks, and firmware.

Source, Maintenance and Recoverability (SM&R) Codes - Uniform codes assigned early in the acquisition cycle to convey maintenance and supply instructions to the various logistics levels supporting a system or equipment.

Supply Support - All functions and actions necessary for determining requirements for acquisition, cataloging, packaging, preservation, receipt, storage, transfer, issue and disposal of spares, repair parts, bulk items and consumables.

Support and Test Equipment - All equipment, mobile or fixed, required to support the operation and maintenance of systems/ projects or facilities at all locations at which support is planned. Those equipment items, both common and specially designed, that are not an integral part of an end item but are required to support the operation and maintenance of the end item.

Test - A test or check of equipment in its operational (or functional) environment, using equipment, and limits specified in the applicable authorized manufacturer publication, manuals, and specifications and technical orders or FAA authorized changes in procedures and limits.

Unserviceable - The condition of an item that cannot be placed in service in accordance with applicable manufacturer's overhaul limits and instructions, or as otherwise authorized by regulations of the Federal Aviation Administration.

APPENDIX C: ITWS PROPOSED DEPLOYMENT SCHEDULE/LOCATION

As the deployment schedule is developed and refined, this list will be updated to show actual installation sites.

LOCATION	FAA LID/Type	Del/CAI

Operational Systems

Alaskan Region (AAL):	(TBD)	(TBD)
(None planned at this time.)		
Central Region (ACE):	(TBD)	(TBD)
Kansas City		
St. Louis		
Wichita		
Eastern Region (AEA):	(TBD)	(TBD)
Potomac MAF:		
(Andrews AFB, Wash National, Wash Dulles, and Baltimore)		
New York MAF		
(NY Kennedy, NY Laguardia, and Newark.)		
Philadelphia		
Pittsburgh		
Great Lakes Region (AGL):	(TBD)	(TBD)
Chicago MAF		
(Chicago Midway, Chicago O'Hare, Milwaukee)		
Cleveland		
Columbus		
Dayton		
Detroit		
Indianapolis		
Minneapolis		
New England Region (ANE):	(TBD)	(TBD)
Boston		
Northwest Mountain Region (ANM):	(TBD)	(TBD)
Denver MAF		
(Denver.)		
Salt Lake City		
Southern Region (ASO):	(TBD)	(TBD)

Central Florida MAF
  (Orlando and Tampa.)
Miami TRACON
  (Miami and Fort Lauderdale.)
Atlanta
Charlotte
Cincinnati
Louisville
Memphis
Nashville
Raleigh/Durham
West Palm Beach
San Juan

Southwest Region (ASW):   (TBD)   (TBD)
Dallas MAF
  (Dallas FW and Dallas Love.)
Houston TRACON
   Houston Hobby
   Houston Intercont
New Orleans
Oklahoma City
Tulsa

Western Pacific Region (AWP):   (TBD)   (TBD)
Phoenix

Support Systems

FAA Mike Monroney Aeronautical Center (AMC):
  FAA Academy (AMA)   (TBD)   (TBD)
  ITWS Program Support Facility   (TBD)   (TBD)

FAA Technical Center (FAATC):   (TBD)   (TBD)

Heading Key:
   L/ID: FAA location identifier.
   Type: Type of modular system required at site.
   DEL: Delivery date; (Simple arrival of equipment on site will not constitute
"Delivery").
   CAI: Contract Acceptance Inspection completed date.

APPENDIX D: SUPPORT AGREEMENTS

(This appendix is reserved for support agreements and will include the Program Directive between AOS and PMO/ALM when it is available.)

APPENDIX E: SUPPLY SUPPORT REQUIREMENTS

Site Spare Parts Requirements List:

Cage	Reference	NSN	Qty Per	Item Name	Number	Unit
Issue						
xxxx	xxxxx	xxxxxxxxxx	xxxx	xxxxxxxxxxxxx	xxxxxxxx	xxxx

Depot Spare Parts Requirements List:

Cage	Reference	NSN	Qty Per	Item Name	Number	Unit
Issue						
xxxx	xxxxx	xxxxxxxxxx	xxxx	xxxxxxxxxxxxx	xxxxxxxx	xxxx

Schedule A--Supplies and Working Equipment (Depot Supported):

Cage	Reference	NSN	Qty Per	Item Name	Number	Unit
Issue						
xxxx	xxxxx	xxxxxxxxxx	xxxx	xxxxxxxxxxxxx	xxxxxxxx	xxxx

Schedule B--Supplies and Working Equipment (Non-Depot Supported):

Cage	Reference	NSN	Qty Per	Item Name	Number	Unit
Issue						
xxxx	xxxxx	xxxxxxxxxx	xxxx	xxxxxxxxxxxxx	xxxxxxxx	xxxx

APPENDIX F: MAINTENANCE REQUIREMENTS DOCUMENT

MAINTENANCE REQUIREMENTS DOCUMENT (MRD)

INTEGRATED TERMINAL WEATHER SYSTEM (ITWS)

1. PURPOSE.

The purpose of this document is to discuss the factors related to the issue of maintenance support and present the Requirements and Surveillance Life-Cycle Directorate recommendations for the Integrated Terminal Weather System (ITWS). The following component functions of maintenance are examined in developing the recommended maintenance requirements:

a. Restoration response level

b. Equipment certification requirements

    (1) System/equipment levels

    (2) Service

c. Field level maintenance

    (1) System level management and personnel certification

    (2) Diagnostic and repair

d. Depot level maintenance

    (1) Supply support

    (2) Line replaceable unit (LRU) repair

e. Engineering support

f. Logistic support

g. Maintenance training

h. Maintenance staffing

2. DESCRIPTION.

The Integrated Terminal Weather System (ITWS), is a development program initiated by the Federal Aviation Administration (FAA) to produce a fully automated, integrated terminal weather information system to improve the safety, efficiency and capacity of terminal area aviation operations. The ITWS will acquire data from FAA and National Weather service sensors as well as from aircraft in flight in the terminal area. The ITWS will provide weather related products to air traffic personnel that are immediately usable without further meteorological interpretation. These products include current terminal area weather and short-term (0-30 minute) predictions of significant weather phenomena.

3. BACKGROUND.

The responsibility for the maintenance of all Federal Aviation Administration (FAA) National Airspace System (NAS) facilities resides with the FAA. As a result, FAA policy dictates that all Airway Facilities (AF) field elements be staffed with sufficient personnel to accomplish this mission. However, as new systems become exceedingly complex, contain proprietary elements, and often require unique and sophisticated support systems, contract maintenance options are now included with system procurement. Often, it is advantageous to have the contractor provide at least the first year of support and maintenance services. This allows the FAA more time to thoroughly evaluate support requirements, train its personnel, and facilitate a smooth transition to steady state maintenance. In some cases full contractor maintenance and support may be the primary mode of system support selected for both short (interim) and long term (depot).

This document reviews the issues involved and presents the best alternative for meeting long term maintenance requirements. It is intended that the final version of this document be coordinated with the regions and the FAA Logistics Center (FAALC) prior to signature by ALM-1.

4. CRITERIA.

After evaluation of the relevant issues, the recommendations or decisions must meet the following requirements:

      a. Overall government accountability for quality assurance and system integrity. This assurance is provided in a number of ways including, but not limited to, maintenance and logistics support, inspection, certification, facility monitoring and control, and overall direction and coordination.

      b. In order that air safety not be compromised, equipment reliability, maintainability, and availability must not be degraded throughout the system life-cycle.

      c. Efficient and cost effective use of FAA resources.

      d. Contingency/ability to recover full FAA maintenance support functions should contractual support losses occur.

e. In-depth repair capability and availability at a second-level depot facility.

f. In-depth technical backup to on-site personnel from both an equipment and overall air traffic control (ATC) system basis.

5. MAINTENANCE CONCEPT.

The following maintenance requirements have been considered for the ITWS:

a. Restoration response level - 30 minutes on-site; generally restoration of service will be assigned IAW FAA Order 6030.31E.

b. Equipment certification requirements - In-accordance- with (IAW) FAA Order 6000.15B, ITWS certification may be required because it will display TDWR, LLWAS, and other aviation weather products (i.e., provide essential meteorological information for takeoff and landing aircraft at airports). A final determination of ITWS certification needs to be ascertained. If certifiable, the ITWS integrity, hardware, and software, shall be sustained through the FAA certification process by FAA system specialists.

c. Field level maintenance - This shall be accomplished by FAA system specialists and technicians down to the LRU. For equipment procured as commercial-off-the-shelf (COTS), it would be more advantageous to contract out the initial maintenance, repair, and support of the ITWS for one to two years after the last ITWS is installed. Long term field maintenance and repair beyond the initial phase is planned to be accomplished by FAA technicians and system specialists. However it may turn out to be cost effective to contract out depot and field maintenance on the ITWS. A decision on long term maintenance/repair is TBD based on experience during the implementation phase.

FAA policy requirements state that new equipment shall be designed with Remote Maintenance Monitoring (RMM) capabilities as part of the Remote Maintenance Monitoring System (RMMS) to the extent possible.

ITWS diagnostics and repair will utilize RMMS similar to devices that have been developed for other FAA NAS systems for purposes of enhancing system integrity, reducing maintenance and support costs, minimizing the impact of equipment failures, and facilitating efficient operation and maintenance of NAS facilities. Therefore, all new NAS equipment/subsystems are candidates for RMM capability and subsequent integration into the NAS RMMS system. The RMMS will improve personnel productivity by enabling centralized operations and maintenance techniques. For this purpose the RMMS monitor, command, and control functions shall provide the following minimum capabilities for a system that provides essential ATC service:

(1) Status. Provide real-time facility/service (alarm/alerts) information to the control point(s) (normally the controlling Maintenance Control Center (MCC)).

(2) Control. Provide facility/equipment reconfiguration and reset/recycle capabilities through the remote command and control functions to ensure service availability and facilitate remote restoration.

(3) Performance. Provide performance and trend analysis data needed to satisfy remote certification requirements, verify system integrity, and support predictive failure analysis from the designated MCC.

(4) Fault Isolation. Execute/retrieve remote diagnostics to facilitate fault isolation to the LRU including the RMM subsystem(s).

d. Depot level maintenance - This shall include supply support and LRU repair. Initial depot level maintenance and support will be contracted out for an initial period of not less than one year after installation of the last system. Depot level maintenance and support beyond the initial phase will be determined for COTS procured equipment at a later date. All application software developed for the ITWS will be FAA owned. Application software developed by the contractor for the Federal Aviation Administration (FAA) shall be portable from one operating system to another without modification, requiring only minor recompilation. The Operational Support Directorate, AOS, is responsible for maintaining all FAA NAS owned software.

e. Engineering support - Primary life-cycle engineering support will be provided by the Requirements and Life-cycle Directorate (ALM) of the FAA Airways Facilities Organization. This includes overall technical and NAILS management support by the Surveillance Life-cycle Division of ALM. The FAA Operational Support Directorate (AOS) will be responsible for second-level engineering support. Second-level hardware and software support will be provided to NAS facilities for the life of the deployed system. This support will be accomplished by AOS personnel and qualified contractors.

f. Logistics Support - This shall be provided by the FAALC, who will be the point of contact for the field to acquire repair and replacement parts upon the procurement of ITWS-specific hardware. The initial recommended logistics support approach is to allocate ITWS functions on the basis that the initial deployment of the ITWS will provide well-defined, beneficial products available as ITWS/TDWR display (GFE) and a COTS processor platform. Interim repair and support will be provided by the contractor during the initial phase and continued for a period of not less than one year after the last system is installed. Once the system is procured, a decision will be made on whether logistics support, including replacement parts repair, will be via the FAALC or through a contractor. The FAALC, in conjunction with the NAILS management program in the FAA Surveillance Life-cycle Division, ALM-400, will determine whether contractor or organic LRU repair will be cost effective for the ITWS, particularly if most of the ITWS hardware is procured as COTS equipment. Software development will be government sponsored, as there is no vendor providing ITWS-like products or services for the terminal area. In other non-developmental areas, ITWS ATC products may be displayed on other systems as they become available, e.g., Tower Control Computer Complex (TCCC), the Geographical Situation Display (GSD), etc.

g. Maintenance Training and Staffing - Technical training can be defined as the training required to provide the knowledge, skills, and abilities that enable system specialists to troubleshoot, isolate, and correct any hardware and/or software malfunction in the ITWS. A training program must be established for FAA personnel engaged in management, operations, hardware and software maintenance, and in the training of operations and maintenance personnel. Training for FAA systems maintenance technicians is required to the LRU level for the ITWS hardware. Additional training is also required for the second level engineering support personnel located at the FAATC. Specific software training that includes knowledge of the contractor software source coding shall be provided to AOS personnel at the FAATC. This training is necessary in all maintenance concepts as a contingency for contractor default. ITWS training could be provided by either the FAA Academy or by a contractor. Should the FAALC accomplish LRU repair, then they will require component level training for the COTS hardware. FAA AOS-200 and AOS-500 both require component through system maintenance training for hardware and software to enable them to provide second level engineering support. Training requirements to support all levels of training will be determined by AFZ-100. Identified FAA technical personnel must be trained prior to the Operational Readiness Demonstration (ORD).

FAA System Specialists will be trained to acquire sufficient knowledge of both hardware and software system operation to allow real time analytical decisions regarding integrity of the ITWS. This will enable them to develop the expertise to determine the most prudent measures to be taken in event of malfunctions or degradation.

FAA site technicians are responsible for providing on-site preventive and corrective maintenance. Field corrective maintenance activities will consist of troubleshooting, replacing the failed LRU, and sending the defective unit either to the FAALC or to a contract facility, as directed by the FAALC.

The contractor and/or FAA AFZ-200 should perform a staffing study in order to identify staffing impact/requirements to the maintenance and support organizations.

The FAA Operational Support Directorate (AOS) and along with contractor support will be required in the initial implementation phase in the area of software maintenance. Regardless of whether or not contractor support is used, AOS is responsible for the configuration control process and to provide assistance to the field as required.

6.0 MAINTENANCE REQUIREMENTS.

a. Mean-Time-to-Repair (MTTR).
The MTTR of the ITWS equipment shall not exceed 0.5 hours. This repair time includes removal and replacement of LRUs and other display parts and all adjustments required to return the system to normal operation. This time does not include means for reaching the repair site. Periodic ITWS preventive maintenance checks shall be according to a schedule TBD after award of contract. Corrective maintenance is that maintenance

activity performed on an unscheduled basis to restore equipment to satisfactory operating condition. In the initial support phase after implementation, this service will be performed by contract personnel when equipment failure occurs. FAA maintenance technicians will perform repair and support beyond the initial contract support phase.

      b. Risk-to-Mission Accomplishment.

In accordance with a previous FAA study on Structured Maintenance, risk is classified as limited, moderate, or high. Limited risk applies to situations wherein the loss of a facility would cause only minor inconvenience, with no traffic delays. Moderate risk applies to situations wherein the loss of facility could cause traffic delays, but would be more local than national in scope. High risk applies to situations which potentially could create widespread traffic delays or affect flight safety.

The ITWS Program is classified as Moderate Risk.

      c. Responsiveness.

This factor is the ability and timeliness of an organization to provide the needed maintenance service. Of primary importance is the degree of responsiveness by the maintenance organization to restore the facility to service. The restoration level for the ITWS will depend on location and criticality of the systems that provide data to ITWS (TBD - related to certification issue).

      d. Integrity.

A high degree of system integrity is sustained through the validation/verification/certification process, which must be provided regardless whether the ITWS is FAA or contractor maintained.

      e. Interim Contractor Maintenance and Logistics Support.

Interim Contractor Support is anticipated throughout the implementation phase of the ITWS to be for a period of not less than one year after the last system is installed.

      f. Logistics Support.

Initial depot spares, support and test equipment will be provided and funded through F&E by the program office by contract line item. Initial on-site spares will also be provided via F&E funds. Initial logistic support will be provided by the contractor for the first year and funded by F & E. The FAALC will provide long-term logistical support.

      g. Training Considerations.

Initial training for this program shall be provided by the contractor. Long-term training will be administered by the FAA Academy.

      h. Effective Utilization of Resources.

AF workload staffing estimates will be developed by the AAF Directorate for Resource Management (AFZ).

7. **CONTINGENCY.**

Contingency planning must be accomplished during the design phase of system development. If the contractor maintenance option is chosen, an alternate plan must be developed which will permit full FAA takeover should the need arise; e.g., contractor bankruptcy, etc. Therefore, provisions should be made for obtaining the necessary structural and electronic data required for depot level maintenance and logistics support. This should include MIL-T-31000 drawings, FAA-D2494/b instruction books, and DOD-STD-2167 software documentation.

8. **RECOMMENDATION.**

a. It is recommended that a combination of FAA supplied depot level spares support and contractor field maintenance support be employed for the ITWS Program. Initial support will consist of contractor site maintenance and depot level support, including spares and test equipment. It is possible that long term depot level maintenance and support on the ITWS hardware may be accomplished by contractors under guidance of the FAALC for procurement of a COTS based system. However this remains to be determined until after contract award; otherwise long term support will be provided by the FAA, with training provided by the FAA Academy. In any case, the FAA will provide software maintenance and second-level engineering support.

b. This document should be used throughout the acquisition and subsequent deployment process and incorporated into the Integrated Logistics Support Plan (ILSP) and will be updated as more detailed training, staffing, and maintenance support requirements are developed.

9. **WAIVERS.**

Order 6000.41, Policy Governing Contractor - Assisted Maintenance for the National Airspace System, requirements are not applicable if full FAA maintenance is recommended and selected:

Integrated Terminal Weather System (ITWS)

compliance met: yes _____   **waivered:**   yes _____

no _____   no _____

10. **AUTHORIZATION.**

The initial Integrated Terminal Weather System (ITWS) Maintenance Requirements Document (MRD) described herein is approved:

CONCUR:

NON-CONCUR:

_____
Manager, Surveillance Life-Cycle Division,
ALM-400

DATE: _____

CONCUR:

NON-CONCUR:

_____
Director, Requirements and Life-Cycle
Management Directorate, ALM-1

DATE: _____